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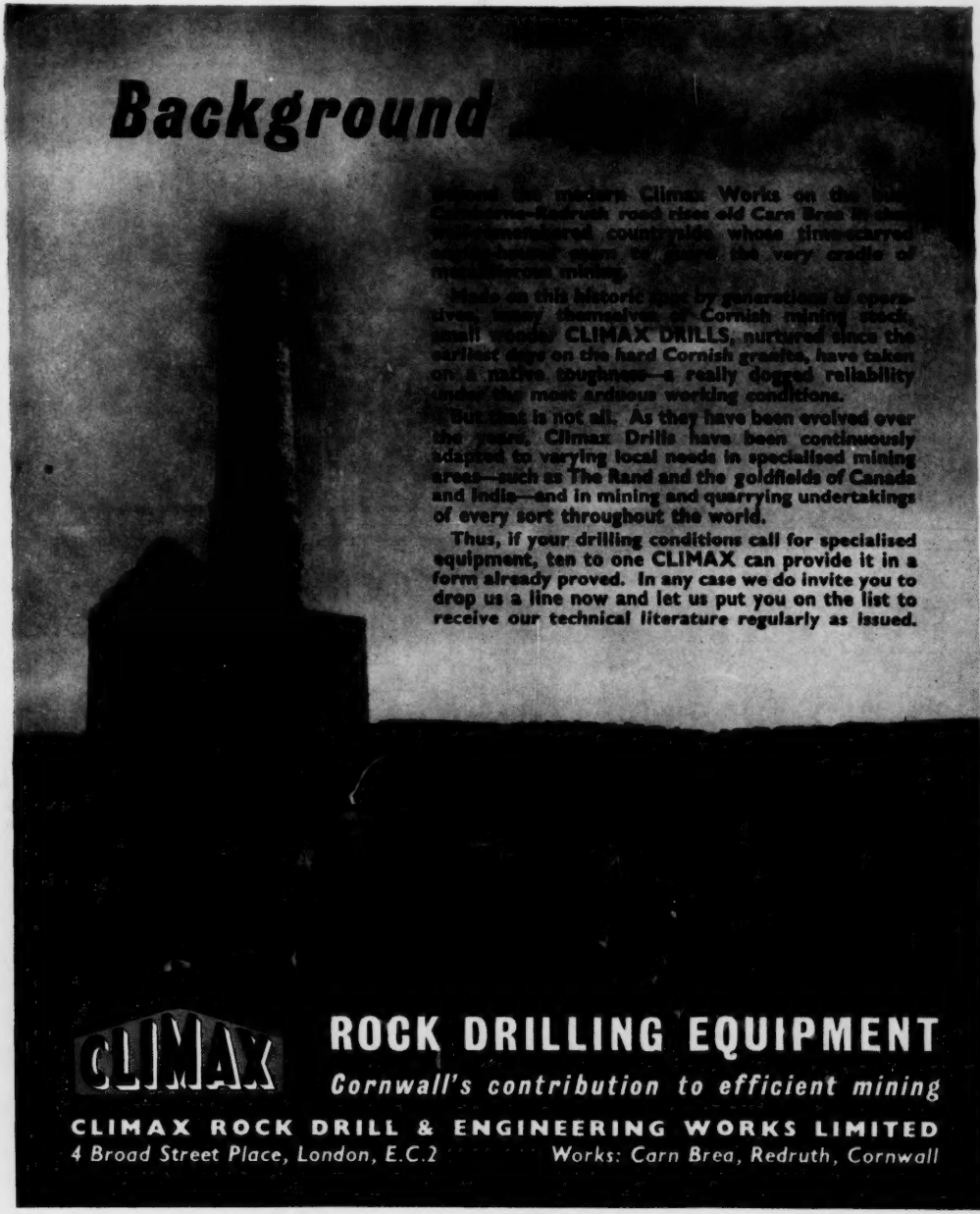
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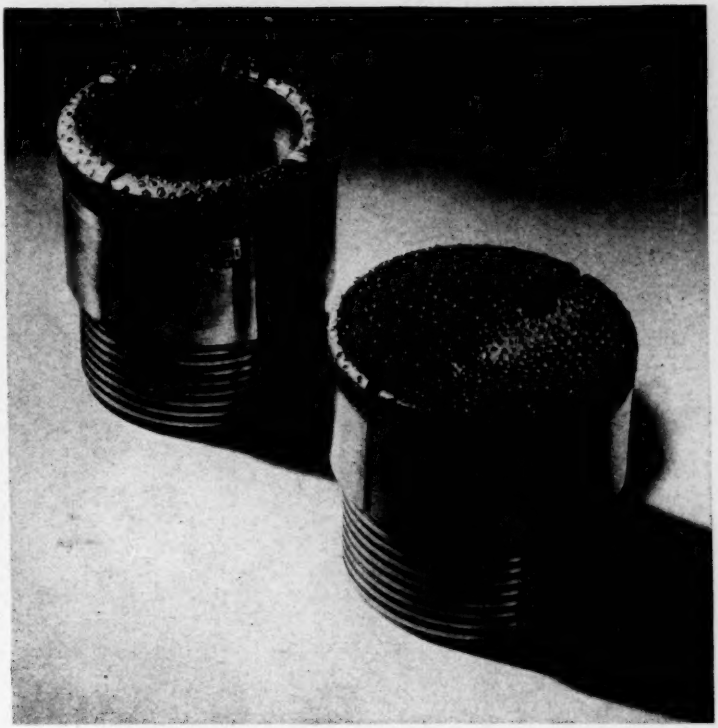

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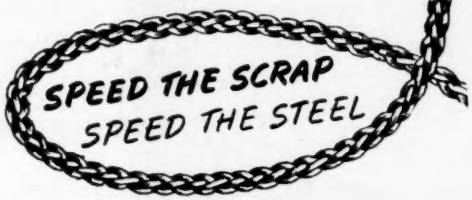

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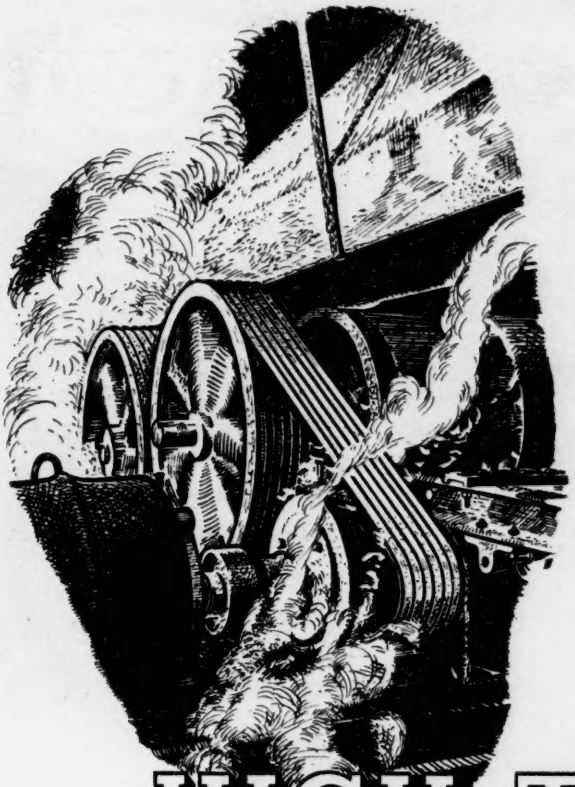

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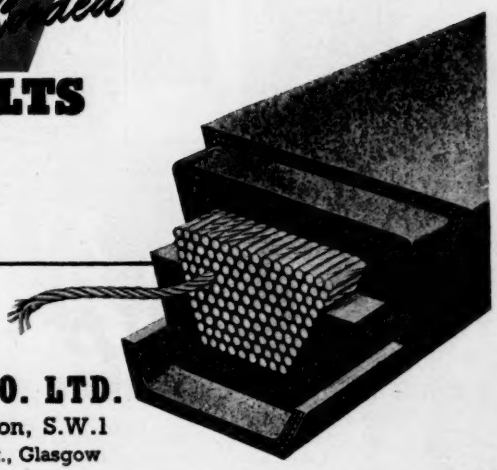

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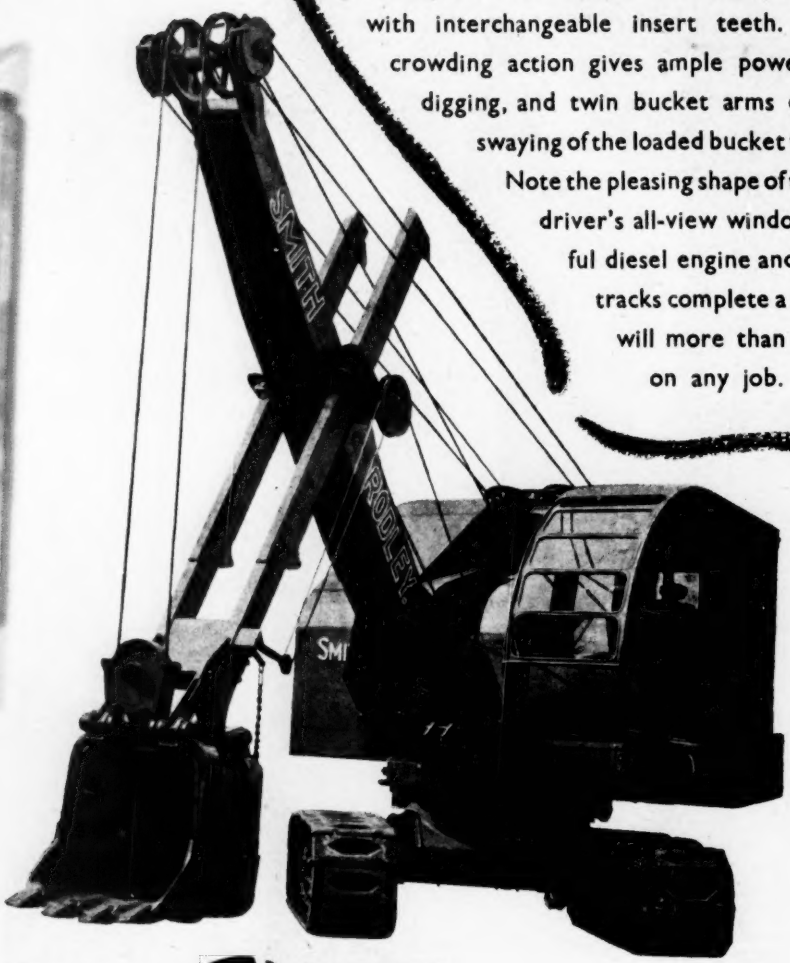

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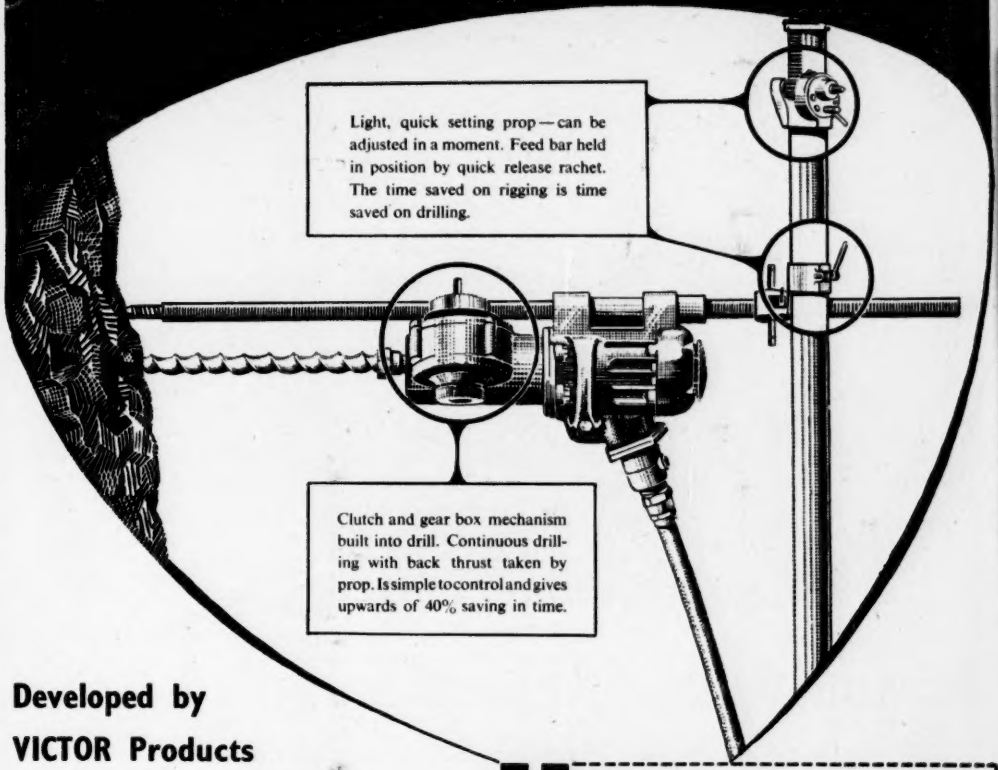

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H.M. King George VI.

TO-DAY the British Commonwealth mourns the passing of its King—a man beloved and esteemed by his subjects in every part of the world alike for what he has done and the manner of its doing.

In his courage, simplicity and domesticity, as in other characteristics, King George VI exemplified many of the qualities which we like to consider essentially British and in which perhaps lay the key to the deep affection in which he was held not alone in the Commonwealth, but in many other countries besides, whose peoples owed him no allegiance.

The evolution of the British Commonwealth has been a story of increasing self determination side by side with a gradual devolution of authority from Westminster to the point where the functions of the Mother of Parliaments within the Commonwealth have become primarily co-ordinative. In this situation—as a force both outside and above the British Parliament—the Throne has played a decisive part in retaining the unity of many states freed, in some cases quite recently, from subordination and now bound together alone by ties of history, sentiment and common interest. That it has done so has been due in a large measure to the qualities displayed by our late Sovereign, who not only during his reign but throughout his life set so inspiring an example in his public and family life.

He touched the life of his people at many points. Brought up a sailor, he saw active service at Jutland, and by October, 1918 he was on the Western Front, qualified as a pilot in the Naval branch of the R.A.F. In the Second World War the persistent refusal both of the Queen and himself to leave London even at the height of the Luftwaffe's attacks became the symbol of resistance and humanity both for the Commonwealth and for the captive peoples of Europe. Throughout the War the King was indefatigable in visiting all sectors of the War effort in Britain—military and civilian alike, as well as visiting the allied forces overseas.

The King had always shown a special interest in industrial questions, and the problems of industrial welfare were his close concern at a time when this aspect of management received less consideration than it does to-day. Again he displayed a very practical appreciation of the social problems of an industrial civilization in the establishment of the Duke of York mixed summer camps for public schoolboys and boys from working class homes.

He was himself a versatile sportsman and there was no branch of our national sports in which he did not display a keen personal interest.

Perhaps no aspect of his reign won greater respect and affection than the manner of his accession. Called upon suddenly and entirely unexpectedly to assume the burden of kingship for which he was to a considerably extent unprepared by training and which to one of his temperament could hardly have been other than distasteful, he and his family responded to the call of his subjects—by no means least to the call of those overseas—in a manner beyond all praise and in a remarkably short time had fully restored the prestige of the throne which, at the time of his accession, had momentarily seemed in jeopardy.

The ill-health which beset him in recent years, resulting in his death at the relatively early age of fifty-six, must be counted a consequence of the devoted service which the King gave his people throughout the troubled and adventurous years of his reign. Nor, at a time when our thoughts and sympathy must be with the widowed Queen as with Queen Mary, who has already suffered such painful bereavements, must we fail to pay tribute to the never failing support which they brought to the Sovereign in his arduous duties and to the affection in which they are held throughout the Commonwealth.

So closes a chapter in our national history. The King is dead, long live the Queen. Queen Elizabeth II succeeds to the throne at a time when the difficulties threatening these islands are no less than those which her illustrious namesake by example and leadership helped her people to overcome. It is thus with a confidence born of history as well as with her subjects' personal knowledge of the new Sovereign that under the Queen's leadership, to the preparation for which her life has long been dedicated, the peoples of the British Commonwealth face the difficulties that lie ahead. May they cause posterity to record this second Elizabethan reign as another outstanding chapter in our history.

NOTES AND COMMENTS

Mr. Prain on Taxation and Domicile

The taxation proposals, as affecting new mines in the territory, recently tabled by the Northern Rhodesian Government and referred to in the Annual Statement of Mr. R. L. Prain, Chairman of Mufulira and Roan Antelope Copper Mines, once more brings into the open the complex questions of mining taxation and domicile.

For many years now it has been apparent that unless and until the U.K. taxation code as applied to the British overseas mining industry is modified to meet the special requirements of mining companies, London would gradually lose its former pre-eminent position as the centre of world mining finance. More recently, the exodus of several important mining companies has seriously weakened London's position—a fact, the seriousness of which has been heightened rather than diminished by the passing of the recent Finance Act.

When the base metal companies of the Anglo American Corporation group transferred their seats of control to Northern Rhodesia about a year ago there were many who thought that this would be followed by a similar move on the part of the companies in the Rhodesian Selection Trust group. This move did not eventuate and Mr. Prain in his statement to shareholders last year explained the reasons for this decision. He said that the tax savings which would accrue on transfer abroad, while substantial, could not necessarily be regarded as permanent and were not in themselves sufficient reason for abandoning the well-tried conception that overseas mining should be undertaken by strong finance groups resident in one of the world finance centres. In so far as Mr. Prain still feels that taxation alone should not be allowed to determine so important a question as the seat of control of a company, he has not changed his views. On the other hand, in his statement to shareholders just published he states that with the present disparity of taxes the change of domicile would now effect "impressively large savings in taxes for the company and hence indirectly for all its shareholders." If this were not enough to destroy Mr. Prain's case on its economic aspect the recent tabling by the Northern Rhodesian Government of new mining laws which will enable new mines to write off their initial capital expenditure out of profits before taxes become payable and thereafter, allow all capital expenditure in any year to be computed as an operating cost should make it very difficult for him to consider the economic factor as a deterrent to emigration.

The directors still feel, however, that political and administrative considerations outweigh the element of taxes. But here again the tide of events seem to be running counter to the arguments raised. In his recent statement he points out that events appear to be moving rapidly towards a shift in the centre of political gravity for Northern Rhodesian affairs from the United Kingdom to Rhodesia and such a change in the political picture, he suggests, might well create conditions under which it would be the directors' duty to shareholders, to Rhodesia and, indirectly, to the Commonwealth to seek to establish the group's seat of control in central Africa.

This argument, of course, clashes on all points with the substance of Section 36 of the recently enacted Finance Act which provides, amongst other things, that Treasury consent must be obtained before the control of a company can be transferred abroad. This provision Mr. Prain strongly condemns and pertinently declares that this section of the Act attempts to make permanent an existing pattern of business organization which might well be out of place in different circumstances. It may become vital, he said, to a mining company to move its control to the seat of its operations if new political movements are developing there for by so doing the interests of such a company and of this country are parallel "since it is surely far more important for this country to retain influence over sources of raw materials, than it is for it to cling to a relatively small fraction of revenue, which may anyway disappear if a semi-feudal attempt is made to cling at any cost to the patterns of yesterday."

Elsewhere in this issue details are given of the way in which companies in this group are expanding the scope of their mining activities to include large virgin areas which in a few years should yield vast quantities of strategic materials. Thus the loss to this country should these companies emigrate hardly needs emphasizing.

Bank Chairmen on the Country's Plight

Speeches of the Chairmen of the Joint Stock Banks were, this year, tied up with the country's economic and financial conditions. All referred to the economic illusions of past policy which has brought the country to the brink of insolvency.

The loss which the Midland Bank suffered in the death of the Marquess of Linlithgow, was emphasized by the posthumous publication of his statement. This late chairman of the country's biggest Bank, saw in the quickened depreciation of the pound and violent disturbance of the balance of payments, convincing evidence of the overstrained condition of our economic resources.

Lord Aldenham, chairman of the Westminster Bank, strongly denounced the complacent attitude induced by the expression—"the terms of trade have moved against us." Too often it has been used to conceal defects in ourselves, he declared. And he forcefully put forward the root causes of the canker eating into our economic system. He averred that by making drastic cuts in imports and restricting credit for non-essential purposes, the new Government was taking two very important necessary steps. He cited the burden of our obligations—American and Canadian loans, rearmament, loss of Abadan refinery, etc., and asserted that the solution of most of our economic problems resided in increased production. The motive force of industry and the tempo of output were demonstrably insufficient for our needs. A central factor emphasized was coal output. If, he said, an extra 20,000,000 tons of British coal could be raised, we should see the economic affairs of our country and of all Western Europe "in a truer perspective."

Preparation of the ground for the eventual free convertibility of sterling was welcomed by Lord Balfour of Burleigh, chairman of Lloyds Bank.

In an enlivening maiden address as chairman of Barclays Bank, Mr. A. W. Tuke took for his theme the planned economy. After six years' efforts, he declared, the most optimistic partisans of planning must be disillusioned by what they see at the present moment. He lamented the delay in up-pricing gold which, had it been done earlier, he contended, would have spared some of the pain of the inter-war period. He expressed great hope in the application of monetary discipline to put the country's economy on a sound basis. After referring to the nationalization of the railways and coal mines and loss of taxpayers' money, he reasoned that mathematically and statistically they may be beyond criticism. No allowance was made, however, for "the reactions to be expected from human beings and from the forces of nature, which beat them every time."

Methods and Equipment for Circular Shaft Sinking at Virginia and Merriespruit Mines

By GORDON S. de VILLIERS

Both the Virginia and the Merriespruit Gold Mines—which are controlled by Anglo-Transvaal Consolidated Investment Co., Ltd., and in which the Kennecott Corporation of New York are substantially interested—are in the shaft sinking stage, and the purpose of the following short paper, which was presented by the author, who is Underground Manager, Virginia O.F.S. Gold Mining Co., Ltd., at the 1951 American Mining Congress, is to give an outline of the technique employed at Virginia No. 3 Shaft in which the following successive world records were established: 470 ft. sunk and concrete lined (March, 1951); 504 ft. sunk and concrete lined (April, 1951) and 389 ft. sunk and concrete lined and station fully excavated and concrete lined (May, 1951).

The initial diamond drilling programme, apart from disclosing that an area sufficient to sustain two large mines were underlain by payable basal reef conglomerates, also yielded the following information:

(i) Shafts would have to penetrate approximately 1,000 ft. of shales with occasional interbedded sand-stones, followed by a further 1,000 ft. of amygdaloidal lava, before passing into fractured quartzites;

(ii) Artesian water was likely to be encountered in the lava and quartzites, while the upper shale zone would also contain large quantities of water along dyke and sand-stone contacts. All underground waters would be heavily charged with methane and would also be exceptionally corrosive;

*(iii) The upper shales varied in consistency from an un*compacted mud to a solid rock which, however, disintegrated rapidly when exposed to the atmosphere;

(iv) The geothermic gradient would be 60 per cent steeper than on the Witwatersrand, where the average gradient is 1°F. per 212 ft. of depth.

SELECTION OF SHAFT DESIGN

*The consulting engineers of the Anglo-Transvaal Con*solidated Investment Co., Ltd., decided, in view of the above information, to sink large diameter concrete lined circular shafts, which were deemed to have the following special advantages: they are faster and safer for sinking *through bad ground and waterbearing formations; they* possess the maximum efficiency for the passing of large quantities of ventilating air, and the circular shape, besides having the greatest inherent strength, lends itself to a more effective application of the cementation process, and permits *of increased efficiency of supervision.*

The circular shaft suffers, however, from the disadvantage of not possessing the same hoisting capacity as a rectangular shaft, but it was considered that this could be overcome by installing larger hoists with correspondingly higher skip *loads and winding speeds. Particular emphasis was placed* upon the necessity to ensure that a break-through of water into the shaft did not occur during sinking, and upon keeping the shaft permanently dry, for the following reasons:

(i) In the event of a break-through of large quantities of artesian water under high pressure, regaining of the shaft bottom would present a problem of the first magnitude;

(ii) The downcast mine air must be kept at a low relative humidity, so as to give the maximum cooling effect in the mine workings;

(iii) The entrance of corrosive water into the shaft would cause a rapid deterioration in the condition of shaft steel work and equipment;

*(iv) A dry shaft provides more pleasant working condi*tions with consequent greater efficiency, and pumping costs are reduced.

The design ultimately accepted was for a shaft 24 ft. 1in. diameter inside concrete, with pre-cast concrete buntons streamlined for minimum air resistance.

EARLY SHAFT SINKING TECHNIQUE

For the first shafts at Virginia and Merriespruit Mines, conventional Witwatersrand methods for the sinking of *circular monolithic concrete lined shafts were employed.* Generally, this method consists of sinking the shaft for a convenient distance, usually about 60 ft. at a stretch. Sinking is then suspended until that section of the shaft has been lined with concrete. Shuttering for this method consists of steel plates 6 ft. x 2½ ft., 12 of which sections, bolted together, form a complete ring. This shuttering has to be lowered from surface, and returned to surface again when stripped. Such a method of sinking puts a circular shaft at a distinct disadvantage as compared with rectangular shafts, for in the latter, equipping proceeds concurrently with sinking, so that a continuous sinking cycle is maintained.

To overcome this disadvantage, the company's engineers were faced with the problem of evolving a continous sinking and concreting technique for circular shafts. After considerable experiment, plans for such a technique were evolved towards the end of 1950, and the method was tested at *Merriespruit No. 1 Shaft, where the equipment was suit*able. In this test, an advance of 351 ft. in one month was obtained, compared with the previous best of 306 ft. when *utilizing the original method. After several important* alterations and additions to equipment had been made, the *new method was applied in its most advanced state to the* sinking of Virginia No. 3 Shaft, where full scale sinking commenced at the end of February, 1951.

PRESENT SHAFT SINKING TECHNIQUE

The present shaft sinking technique is described below under the following headings: equipment; cementation; sinking and lining procedure; and personnel.

Hoisting equipment consisted of two single drum hoists *of 450 h.p. each, one electrically operated with a winding* speed of 1,300 ft. per minute and the other steam operated *with a winding speed of 1,500 ft. per minute, both hoisting* 60 cu. ft. capacity sinking buckets on 1 in. diameter non-spin steel wire ropes.

The platform hoist is driven by a 100 h.p. electric motor through a worm reduction gear, to give a rope speed of *15 ft. per minute; both ropes travel in the same direction,* being wound over the drums, which are clutchable to allow for adjustments to enable the sinking platform to hang level in the shaft.

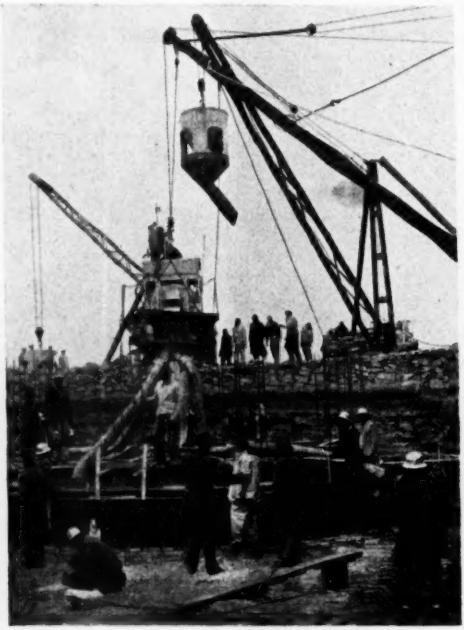
A 100 kW Diesel generating set is placed as a standby in the hoist house and is capable of operating the shaft fan and lighting, or the platform hoist and lighting, so that *sinking may be continued with the steam hoist in the event*

of failure of the main outside power supply. Thus, there are three separate sources of power for raising men out of the shaft in an emergency, as the platform hoist is licensed to raise the sinking platform to surface with a full shift crew.

The temporary headframe for sinking is approximately 80 ft. in height and is of a bolted steel construction. This headframe supports the sinking platform, as well as the winding ropes.

A centrifugal fan, powered by a 75 h.p. motor, forces 15,000 cu. ft. per minute of air down the shaft through 30 in. galvanized iron piping. This quantity of air clears the smoke and fumes from the blast away from the shaft bottom sufficiently rapidly to allow of immediate re-entry by men.

A large cement storage shed is provided close to the shaft with capacity for 5,000 pockets (1 cu. ft. each) of cement. In one end of this shed are mounted the three cementation pumps and a section of the shed is also walled off for use as a supply store for minor items.



Construction of the shaft collar at Merriespruit No. 1 shaft, showing how the reinforced steel is being placed in position. The bucket at the top of this picture conveys concrete from the mixer to the distribution box, whence it flows through hoses into position behind the shuttering. The stone ledge in the background will form the floor of the high service gallery shown in the illustration on p. 139

Electric power is tapped from the mains at 6,600 volts, and is transformed and distributed at the voltages required for various purposes. Compressed air is pumped through a 12 in. line from the central compressor station about two miles away, and is delivered down the shaft through an 8 in. column.

Water for drilling is taken from the main supply into a 20,000 gallon reservoir which acts as a reserve, and is piped down the shaft in a 2 in. column, which is fitted with a pressure release every 250 ft., so as to prevent an excessive build-up of pressure which would burst the water hoses at the shaft bottom.

The shaft office building contains the usual offices and also the First Aid room, change-house, mechanics workshop and electricians workshop. Concrete for shaft lining is provided by two 1 cu. yd. Blaw-Knox mixers, one mounted on either side of the shaft with discharge 12 ft. above collar level. Concrete is discharged from each mixer into 1 cu. yd. Blaw-Knox buckets, which travel suspended from cradles mounted on monorails to a position over the shaft, where they discharge into 1 cu. yd. Blaw-Knox buckets suspended on the winding ropes.

Waste rock from the shaft is tipped directly into 3 ton side-tipping cars standing on tracks on the shaft cover doors, from where the cars are hauled up a ramp and tipped into a waste bin. Waste from this bin is transported to the waste dump by 5 ton dump trucks.

The blasting cubicle containing the necessary switches is provided on the shaft collar, from whence the round is blasted electrically. The sinking platform consists of two decks 30 ft. apart, suspended in the shaft by two ropes which are each attached by one end to the headframe. These ropes pass down the shaft and round the sheave wheels under the top deck of the platform, then up the shaft again, over two sheave wheels in the headframe to the double drums of the stage hoist. Concrete from the Blaw-Knox buckets is discharged into a central receiver built into the stage, through chutes which are lowered from their upright position to cover the winding compartments.

From the receiver the concrete flows through four rubber hoses of 8 in. diameter, which are placed so as to enable the concrete to be directed behind the shuttering. The sinking platform is equipped with four vertical jibs situated at equal intervals around the circumference of the top deck, and four hand-operated winches of 5 ton lifting capacity, which are fixed so as to be conveniently operated from the bottom deck. Half inch ropes pass from the winches over the jibs, and are equipped with hooks for suspending and lowering a complete ring of shuttering.

The steel shuttering used in this method is the same as that previously described, except that the keyplate is reduced to a width of 6 in. for easy withdrawal.

CEMENTATION

The cementation process is used for sealing off water around the shaft, and is fitted into the sinking cycle as follows: (i) cementate 40 ft. in advance of sinking; (ii) sink 30 ft. (leaving 10 ft. cementation cover); (iii) cementate 40 ft.; (iv) sink 30 ft.; (v) concrete line 60 ft.; (vi) cementate, etc.

In the cementation period, 16 holes, each 40 ft. in length, are drilled through high pressure valves which are screwed on to casing pipes grouted into the shaft bottom around the periphery. These holes dip outward from the shaft at 10° from vertical, and also dip circumferentially at 10° off radius. The pattern of these holes is thus similar to the arrangement of spokes in a bicycle wheel, and is designed so as to ensure that any adjacent fissure, of whatever dip or direction, will be intersected. These holes are drilled with 3½ in. leyner machines suspended by ropes from pulleys below the sinking platform, using 1¼ in. round hollow steel equipped with lug shanks and threaded 2 in. detachable tungsten carbide tipped bits.

All holes, whether containing a flow of water or not, are sealed with cement grout by connecting the casing pipes to the surface cementation pumps by means of 1¼ in. high pressure piping pinned to the shaft walls. It is essential to grout dry as well as wet holes, for dry holes may have intersected fractures or fissures into which water may penetrate when pressure is later applied by the cementation pumps to an adjacent water-bearing fissure.

In the case of Virginia No. 3 Shaft, the initial diamond drilling programme indicated that the shaft would pass through relatively dry ground. In these circumstances, sinking was undertaken without full cementation cover, although the usual equipment was provided in case it should be required. (Cementation was, in fact, necessary on two occasions.) As cementation cover was not provided, six 15 ft. pilot holes were drilled with every shaft round. These holes were drilled with the same machines and steel as the round itself, one extra length of steel being added to deepen the pilot holes from 7 ft. to 15 ft.

SINKING AND LINING PROCEDURE

After the shaft collar had been constructed, and the shaft sunk to 80 ft. and concrete lined to 77 ft., the sinking platform was suspended in the shaft and the shaft cover erected. All pipes, manifolds and cables were fitted and made ready for normal extension as the shaft advanced. 32½ ft. of steel shuttering was left in position after the last lift of concrete walling had been completed. Full scale sinking was then commenced, sinking and all other operations being carried out on a three 8 hour shifts per day, seven days per week basis. Each round pulled was approximately 6 ft. These rounds were of 116 holes each, the holes being arranged in six concentric circles and the complete round was drilled in one hour by 18 drillers, and mucked out manually in 5½ hours; the remaining 1½ hours were occupied in charging up, blasting and changing shift.

After six rounds had been drilled and blasted, the broken ground from the sixth blast was only partially mucked, the remaining broken ground being levelled at exactly 32½ ft. below the bottom of the existing concrete lining.

At this stage, the sinking platform was lowered so that the bottom deck was level with the bottom of the concrete lining, which meant that the jibs on the top deck were above the top ring of shuttering plates. The ropes over these jibs from the winches were then attached to the bottom ring of shuttering plates and the small key-plate knocked out so that the weight of the entire ring was taken by the ropes. The bottom ring was lowered about 2 ft. and attached to another ring by means of six chains, equally spaced around the circumference, and of exactly 32½ ft. in length. The bottom ring was then lowered until its weight was taken by the chains which meant that it was just touching the loose rock in the bottom of the shaft. The centre plumb-bob was then lowered and this ring centred and blocked to the side wall at every joint. It was then checked for level by means of a dumpy level, and a very thin layer of sand placed in the annulus to prevent concrete from adhering to the broken rock. Concrete mixed with water containing 1½ lb. of calcium chloride per gallon, to give a final set within the hour, was lowered and placed behind this ring by means of a metal chute attached to the bottom of the Blaw-Knox bucket. When this ring had been filled, the sinking platform was again moved up the shaft, mucking started immediately, and the normal sinking cycle resumed.

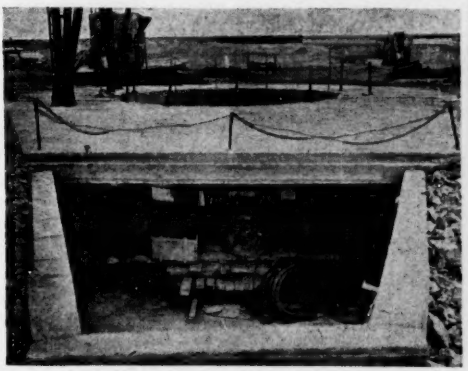
USE OF BLAW-KNOX BUCKET

On the third shift after this procedure, while the broken rock from the second blast was being mucked, the stage was lowered so that the bottom deck was level with the top of the other ring. Five further rings were then lowered in turn and built up upon the foundation ring. As soon as the shaftman could spare a bucket from mucking, he handed it over to the stage man who replaced the sinking bucket with a Blaw-Knox bucket and immediately proceeded to fill behind these rings with concrete so that, by the time the shaftman had finished drilling and was ready to blast, the lining was completed up to the fifth ring. The sinking platform was moved up the shaft to a safe distance before blasting.

When the following shift entered the shaft to commence mucking, the stage man lowered the platform so that the bottom deck was level with the top of the fifth ring. In the same manner as previously described, he lowered and built up five rings and again, while drilling was taking place, filled behind these rings with concrete. During the following shift, the fifth, the last two rings were lowered into position and filled with concrete.

It will thus be observed that sinking is continuous, except for the delay occasioned in pouring the initial concrete ring in each new shaft section of 32½ ft. This latter process has averaged a period of two hours per cycle of 32½ ft. and, as yet, no satisfactory method of avoiding this delay has been discovered. It may be mentioned, however, that using the old system of walling, shaft sinking was held up for over 16 hours during the concreting of 32½ ft. of shaft.

The engineers concerned in evolving this new technique were of the opinion that the safety of persons at the shaft bottom would not be endangered. Their confidence has been fully justified, for during the seven months that this scheme has been in operation, not a single manshift has been lost due to an accident that could be attributed to this method of working.



The completed shaft collar at Merriespruit No. 1 shaft. Note the completed collar and the service gallery by which power, water and air are supplied. The shaft diameter inside the lining is 24 ft.

PERSONNEL

As sinking was to be continuous, with manual mucking, labour was organized into four complete shifts, each working eight hours and resting 24 hours, in contrast to the previous arrangement of a shift working for eight hours and resting for only 16 hours. Experience has shown that maximum effort cannot be sustained when continually working at high pressure for eight hours and only resting for 16 hours.

The shaftmen employed 80 natives per shift of whom 18 were drillers. Virginia No. 3 shaft was one of five being sunk in the same area under the same general supervision of a manager, underground manager and engineer, and the services of welders, carpenters, etc., were supplied from a common pool as and when required.

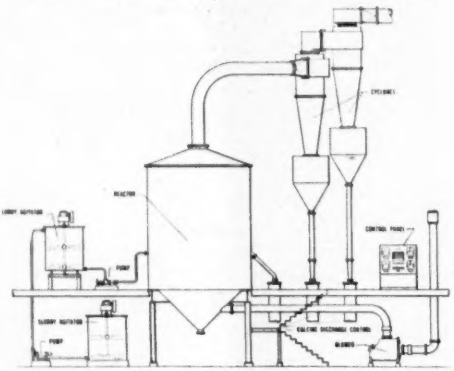
New FluoSolids Experience

By G. G. COPELAND

The following particulars on the design and application of the FluoSolids process have been extracted from a paper presented by the author, who was formerly FluoSolids Sales Engineer, The Dorr Co., Stamford, Connecticut, at the American Mining Congress, held in Los Angeles, October, 1951.

The Dorr Company FluoSolids process, as developed for pyro-metallurgical applications involving the roasting, calcination or heat treatment of ores, etc., has been in commercial use in the non-catalytic field since 1945, and the present world-wide sulphur shortage has caused new emphasis to be placed upon the extraction of sulphur from sulphides of metals by roasting, and the process is playing its part in relieving the situation.

The FluoSolids installation may be described as new metallurgical equipment by which reactions between gases and solids can be more readily accomplished at elevated temperatures and at accelerated rates which have not been possible before. The process is stated to be finding application in many fields, but a typical operation is the roasting of sulphide ores or concentrates to produce sulphur dioxide gas while at the same time producing a calcine containing less than 1.0 per cent sulphide sulphur and less than 2.0 per cent total sulphur. The technique requires that the



The general arrangement of a typical FluoSolids installation

solids, to be reacted, be fluidized or partially suspended in the gas; when so fluidized, by an upward moving gas stream, the solids are in a state of violent agitation and are homogeneously distributed throughout the fluid bed. Fluidized solids in this state obey many of the hydraulic laws and are efficient heat transfer systems.

Operators of FluoSolids units have at their control a means for closely regulating feed rate and gas rate; temperature can be controlled within a few degrees because all other variables are easily fixed, and the whole system is normally under automatic instrument operation. The above illustration shows a general arrangement of a typical FluoSolids installation using the slurry method of feeding.

The use of the FluoSolids Process for producing sulphur dioxide is not confined to the high-grade sulphur-bearing ores. Pilot plant tests in a 5 ft. reactor have demonstrated the feasibility of producing high strength gas from copper and zinc sulphide concentrates. Other tests have shown that pyrrhotite can be used as readily as pyrite, and crushed crude sulphide ores are as easily handled as flotation concentrate. Ores containing as little as 20 per cent sulphur have been roasted successfully with the production of strong sulphur dioxide gas. A 22 ft. diameter unit is currently being installed in Canada and will produce such sulphur dioxide gas for sulphuric acid from zinc concentrates containing about 30 per cent sulphur.

FluSolids Reactors have no moving parts and operators are not able to open parts on the System during operation. Gas strength can only be altered by a change in fluidizing gas volume or oxygen content, or by changing feed rate or sulphur content of the feed. The unit is therefore admirably suited for operation in conjunction with sulphuric acid plants.

Metallurgical companies in the U.S. and Canada, operating smelters for the extraction of zinc and copper from sulphide concentrates, annually throw enough sulphur into the atmosphere in the form of weak sulphur dioxide to more than make up the deficiency of sulphuric acid. For the most part, these plants use conventional type roasters from which high strength gas could not be obtained without radical changes in design, and generally are geographically outside the economic marketing range of sulphuric acid. However, increases in the market value of sulphur will be reflected in the price of sulphuric acid and may soon bring some of these metallurgical plants into the sulphur picture as producers of acid.

A SIGNIFICANT IMPROVEMENT

A significant improvement in the design of FluoSolids units has been the development of a constriction plant which allows free passage of the fluidizing gases and yet prevents solids sifting to the windbox even if gas flow is shut off entirely. This improvement took the form of the so-called "bubble cap" design; it was first installed on the FluoSolids Reactor at the new Carlton Mill of the Golden Cycle Corporation, and has, from all reports, been highly successful. The unit there has been in operation since January, 1951. Bubble caps are inserted into the constriction plate at calculated intervals and are surrounded by refractory insulating material. The addition of these caps has insured that intermittent operation of FluoSolids Reactors will be facilitated even when very finely divided materials are to be fluidized.

The design of cyclone dust collectors is perhaps one of the most critical problems of the FluoSolids System. Special consideration must be given to variations in operating conditions brought about by local handling problems. Dust collection from the exit gas of all FluoSolids Reactors in operation at this date has been adequate. Dust loadings in the cyclone exit gas of about 5 grains per standard cu. ft. of dry gas are standard for conventional FluoSolids Systems. These loadings are acceptable to the gas scrubbing systems in sulphuric acid and sulphite pulp plants.

Significant advances have been made also in the FluSolids Process for controlled sulphatizing of base metals. Temperature control on the order of 10°C. is possible in FluoSolids Systems, and, since the critical sulphatizing temperatures of the base metals have a much wider spread, the control necessary is readily provided. Operation of a

pilot copper sulphatizing unit has been continued throughout 1951 with excellent results. This plant is sulphate roasting copper sulphide concentrates produced in a pilot flotation plant. Soluble copper is leached out of the calcine and precipitated as metallic copper in an insoluble anode electrolytic circuit. Extractions of copper, by recirculated electrolytic cell tail liquor, have been on the order of 97 per cent. Cathode copper analyses show copper contents in excess of 99.8 per cent. Wire bar copper will be produced by conventional single-stage fire refining of the cathodes.

The concentration of the copper in the electrolyte is lowered 50 per cent per cycle and at a power consumption of 1.1 kW A.C. per lb. of copper. Stripping of solution may be done entirely by electrolysis with no cement copper produced. Total power consumption, including stripping of electrolyte to 0.35 grammes of copper per litre, is calculated to be less than 1.3 kW per lb. of total copper recovered. The increased power cost is obviously less than the cost of scrap iron and lime for conventional cement copper circuits.

The whole process is capable of operation without the use of highly skilled technicians and lends itself to use in areas where labour is a problem.

A unique application of sulphatizing roasts on sulphur concentrate comes from Australia where one producer proposes to install two small FluoSolids units for the production of copper sulphate and zinc sulphate flotation reagents from their respective base metal concentrates. Concentrates are simply roasted, quenched in water, and the pulp or leach liquor used as a reagent. This application should be of considerable interest to many flotation plant operators who have access to sulphide concentrates of these metals.

FluoSolids Processes have been developed, and are in commercial operation for the heat treatment of mineral grains and successful pilot plant tests have been completed in the field of beneficiation of low grade iron ore. In the latter case, advantage is taken of the fact that FluoSolids Systems can be operated in a reducing or oxygen deficient atmosphere to convert haematite to magnetite so that separation of iron from insolubles can be readily accomplished in conventional magnetic separators. The scope of this approach to the low-grade iron ore field appears to be limited only to the cost of fuel necessary for the reaction, and much will be heard from this process as more low-grade deposits are brought into the steel picture.

Brazilian Aluminium Industry

(From Our Own Correspondent)

Teresopolis, January 25

The Commission for Industrial Development is studying a proposal by Reynolds Metal Corporation of America to instal an aluminium factory near the Paulo Afonso Falls, North-East Brazil, where the hydro-electric station, now under construction, would supply adequate power. Production would begin on a small scale, but the Company is prepared to invest $U.S.150,000,000 and to manufacture for exportation at a later date.

The aluminium factory, inaugurated in 1946 at Ouro Preto, Minas Geraes, has been taken over by Aluminio do Brasil, subsidiary of Aluminium Ltd., of Montreal, and resumed operations in August. The plant, which will produce 3,000 tons annually, is situated near important bauxite deposits and three power stations. It will receive mineral pitch from the National Steelworks at Volta Redonda, but caustic soda, fuel oil and petroleum coke will be imported for the present. The Company is erecting a factory at Utinga, S. Paulo, to manufacture sheet from the product of its Ouro Preto plant.

Another Canadian firm, H. F. Pollock, has formed a company, with a capital of £2,000,000 to exploit aluminium and other non-ferrous metals in Brazil. It will build refineries and industrialize minerals locally.

Finally, a factory is under construction in S. Paulo to work with bauxite from the Poços de Caldas deposits, in Minas Geraes, where the reserves are estimated at 120,000,000 tonnes. The plant will produce 7,000 tons of aluminium annually.

Brazil produces 4,000 tonnes of aluminium yearly and imports 15,000 tonnes in sheet and ingots. In S. Paulo, alone, 63 factories are manufacturing aluminium goods.

Mineral Export Trade.—During the first eight months of 1951 Brazil exported: iron ore, 818,933 tonnes; manganese, 46,183; wolframite, 677; mica, 1,698; quartz, 489; pig-iron, 33,185; iron and steel manufactures, 391 tonnes. With the exception of manganese all figures represent increases.

In September, United States imported the following from Brazil: iron ore, valued at $U.S.1,042,947, c.i.f.; manganese, $U.S.120,716; mica, $U.S.330,389; tungsten ore, $U.S.4,744; industrial diamonds, $U.S.218,426.

During the last quarter of 1951 the Bank of Brazil issued licences to export: iron ore, 16,256 tonnes (to Belgium); manganese, 50,700 tonnes (U.S.A.); beryllium ore, 614 tonnes (U.S.A.); scheelite, 196 tonnes (U.S.A.); magnesite, 800 tonnes (Chile, Canada, Germany); quartz, crystals and blanks, 35.4 tonnes (England, U.S.A., Japan, Belgium, etc.); mica, 4.3 tonnes (England, Japan, Holland); semi-precious stones, 5¼ tonnes (Germany); columbite, 0.9 (England); iron and steel, 4,767 tonnes (Argentina). F.o.b. prices per tonne unless otherwise stated, were as follows in December: iron ore, £6 3s.; manganese, £9; beryllium, £147 11s. 7d.; scheelite, £181 19s. 7d.; magnesite, £12 11s. 7d.; mica, £1 5s. 9d. per lb.; columbite, £549; steel ingots and pig-iron, £64 16s. and £40 13s. 2d.

Scheelite.—Rio Grande de Norte and Paraiba are the only States exploiting scheelite, although the mineral is also found in Rio Grande do Sul, in pegmatite granite, associated with cassiterite and wolframite. Production is about 720 tons annually.

Columbite.—The most important known deposits are in Rio Grande do Norte and Paraiba, where exploitation was begun in 1937. The metal also occurs in Minas Geraes.

Quartz.—Rock crystals abound in many States, particularly in Goias, Minas Geraes, Bahia and S. Paulo. The Cristalandia deposits in Goias have hitherto been considered the most important, but the Department of Mineral Production, which investigated twenty occurrences in that State in 1951, reports that those at Veadeiros will probably prove commercially more valuable. The mineral, sold on site at around 10d. per oz., is air-borne to Rio.

During the war certain Minas Geraes deposits were actively exploited and exports rose from 747 tonnes, in 1938, to 2,411 in 1943. When hostilities ceased shipments dropped to 170 tonnes, but the demand has recently revived and exports exceeded 500 tonnes in 1951. Seven firms are producing quartz blanks in Brazil for home consumptnon and exportation to England and other European countries.

TECHNICAL BRIEFS

Pelletizing Fluorspar Concentrates—New U.S. Method

A successful method of producing fluorspar pellets meeting metallurgical requirements is disclosed in *Report of Investigations* 4829, "Nodulization and Pelletization of Fluorite Flotation Concentrates," written by H. Kenworthy, metallurgist, Bureau of Mines, Rolla, Mo., just published by the U.S. Bureau of Mines.

Used as a flux chiefly in the production of steel, the supply of coarse fluorspar, commonly called gravel spar, is rapidly being depleted. On account of the growing scarcity of gravel spar, it is generally accepted that ultimate utilization of metallurgical-grade flotation concentrates will be necessary and because the proportion of fines must be kept low, pelletizing or nodulizing will be required.

The objectives of the Bureau's investigation were to study pellet- and nodule-making methods and evaluate some binders, to obtain technical data and determine possible outlets for a future, larger-percentage production of finely divided metallurgical fluorspar, chiefly in the form of flotation concentrates. Small batches of fluorspar flotation concentrates were made into nodules and pellets on a laboratory scale. Several of these were rated acceptable by laboratory evaluation methods.

The most satisfactory pellets were produced by mixing fluorspar with about 12.5 per cent of water, by weight, and 4 per cent organic binders that originated from the petroleum and woodpulp industries. The report gives details of the physical characteristics of the pellets and nodules made with several binders obtained from a few industrial companies. Methods of forming, mixing, heat-treating and testing were varied to fit binder characteristics.

A Novel Method of Ore Separation

A method for the separation of ores by treatment with gaseous polyhalosilanes has been claimed by K. F. Scheu (*U.S.P.* 2,564, 546). The ore is crushed to between 10 and 60 mesh and allowed to fall on to a screen which serves to spread out the particles. These are then passed into a gas chamber in which they are allowed to come into contact with the gas or vapours of, for example, phenyltrichlorosilane or ethyltrichlorosilane, which renders them hydrophobic. The particles then fall into water where the lighter particles rise to the surface and are skimmed off. The heavier particles fall on to a travelling agitator and conveyor belt and are then dropped on to a second screen. The process is then repeated using a higher concentration of gaseous polyhalosilane. To effect complete separation, the process may be repeated a number of times. In the patent, a method for the separation of metallic silver, tungsten and siliceous matter is given as an example.

New Norwegian Galvanizing Plant

Norway's largest galvanizing plant has been opened at the Toensberg Harpoon factory in southern Norway. Instead of the usual iron or steel tank, the new plant is fitted with a tank made of firebrick, which the designer, Ing. H. C. Evensen, claims will reduce the waste of zinc very considerably. The zinc volume is about 100 tons, heated by electric elements amounting to 320 kW.

The tank's galvanizing capacity is put at about 40 tons a day or 12,000 tons a year, and the annual zinc consumption will be about 450 tons. The new galvanizing plant will be able to handle large items which formerly have had to be sent abroad.

International Conference on Underground Coal Gasification

The U.S. Secretary of the Interior, Mr. Oscar L. Chapman, has announced that the United States will be host to the first International Conference on Underground Gasification of Coal early this year. The Conference, which will be jointly sponsored by the U.S. Bureau of Mines, and the Alabama Power Co. of Birmingham, Alabama, will be held in Birmingham and Gorgas, Alabama, for the three days February 12-14.

A feature of the meeting will be on-the-site inspections of a gasification project which is in operation at Gorgas, where the U.S. Bureau of Mines, and the Alabama Power Co. are now conducting their third co-operative experiment on the underground gasification of coal.

Leading European scientists and American experts in the field of underground gasification will take part in the conference and describe experiments in Belgium, the United Kingdom, France and French Morocco, Italy, and the United States. Technologists from several other countries also will present papers or contribute to technical discussions. The foreign visitors participating in the conference will be in the U.S. under the Technical Assistance Programme sponsored by the M.S.A.

In addition to taking part in the international conference, foreign representatives will inspect the U.S. Bureau of Mines stations at Louisiana, Missouri, Pittsburgh and Bruceton, Pennsylvania, and Morgantown, West Virginia, where research on the production of synthetic liquid fuels involving above-ground coal gasification is conducted. Research laboratories and industrial firms also will be inspected. The visiting scientists also will attend a Symposium on Coal Gasification and Hydrogenation in connection with the 1952 Annual Meeting of the American Institute of Mining and Metallurgical Engineers in New York City in February. The Symposium is being sponsored and arranged by the U.S. Bureau of Mines.

New Dutch Material for Magnets

The development of a new material for permanent magnets has been reported at a recent meeting of the Netherlands Physical Society. Called Ferroxdure, the new product, which was developed by the Philips research laboratories at Eindhoven, is a ceramic, and differs greatly from the traditional magnet steels in structure and composition. Its properties were said to offer many new possibilities for the application of permanent magnet materials.

Cobalt and nickel are not required in the manufacture of Ferroxdure, which is produced by sintering or firing, like chinaware, and is described as an oxide, containing iron and barium. The new magnet is claimed to be particularly suitable for use in dynamos, motors and some special kinds of transformers; it is also expected to be of interest to manufacturers of various electrical equipment.

Synthetic Anthracite Developed in the Netherlands

After years of research, Dutch experts have discovered Synthracite, a synthetic anthracite manufactured from soft coal, according to Dutch Press reports. These reports quoting "unofficial but reliable sources" say that a trial plant, in which this artificial domestic coal will be manufactured on a large scale, is well advanced. It is hoped that the new product will solve the acute problem of Holland's domestic fuel supply created by the gradual exhaustion of Dutch anthracite mines.

METALS, MINERALS AND ALLOYS

Although the American metal economy shows every sign of moving away from the idea of a free market, the past week has been notable for some spirited attacks on the conception of scarcity which brought full control at the International Materials Conference into being. Such people as Mr. Wormser, Vice-President of St. Joseph Lead and Mr. Strauss of the A.S. and R., are concerned by the Government propaganda for the use of substitute materials in place of copper, lead and zinc, and are clearly looking ahead to the time, which they feel may not be so far off, when shortages in these metals have been overcome. Some point is lent to this attitude by the recent statement of Mr. Fowler, N.P.A. Administrator, to the effect that he hopes for a civilian economy relatively free from controls by 1953, at which time the U.S. expansion programme should be largely complete, and stocks of essential materials high.

While the danger of the International Materials Conference eventually outliving its period of usefulness should not be overlooked, it might not be inappropriate to point out that from this side of the Atlantic the I.M.C. would seem to have provided a much needed assurance of the equitable distribution of materials which are in entirely short supply to-day, whatever the position may be six months or a year hence.

COPPER.—Even Mr. Strauss admits that there is copper shortage right now, and there is no question but that the position is extremely difficult; copper shortages in some cases actually operating as a brake on steel consumption. Part of the immediate difficulty must be attributed to Chile, who is reported to have only delivered about 50 per cent of the 64,000 s.tons promised to the U.S. during the last eight months of 1951.

Mr. R. L. Prain, of the Selection Trust Group, favours the Ministry's action in not buying copper at prices above that quoted in the *Engineering and Mining Journal*. The existence of this two-price system creates a number of problems, which might only be solved by some upward revision of the official price. Of the International Materials Conference, he has some words of praise, but he cautiously adds that "its progress will be watched with interest."

LEAD.—The price of lead continues to weaken: Mexican lead is fetching only $18.78 per lb. f.o.b. Monterey against $19.02 a week earlier and $19.80 three weeks previously. Consolidated Mining and Smelting of Canada has reduced the quotation for lead to 19c. per lb. a drop of ¼c. As a result of the decline in the premium on the U.S. dollar the U.S. has gone some way towards suspending the import duties on lead; the Senate has passed a bill authorizing this suspension. The present lead duty is 2c. per lb.

The Primary Lead Producers Industry Advisory Committee estimates that five foreign countries will be able to export 17,000 tons of primary lead per month during 1952. The committee asked N.P.A. to revoke immediately the allocation of foreign pig supplies. The committee also wants to discuss the possibility of suspending the allocation of domestic lead. This attitude shows how much easier lead has become recently, partly as the result of changes in the world market and partly because of the settlement of a strike in a U.S. smelter.

The reduction in the price quoted by the Ministry of Materials for lead is not sufficiently large to have much effect on demand. The Ministry's policy of bulk buying is coming in for severe criticism; at £170 per ton, the British price is equal to 21¼c. per lb. This is much higher than the prices quoted above, though it must be admitted that the Ministry is probably bound by contracts with its suppliers. This admission is, however, more in the nature of a condemnation than of an excuse. The British allocation scheme is now serving little purpose; consumers are able to obtain their requirements without difficulty.

Under a contract negotiated by the D.M.P.A., the Compania Minera de Huehuetenango in Guatamala, is to supply the U.S. with 26,250 tons of pig lead over a five year period beginning in 1954.

TIN.—The Indonesian mission on tin has arrived in the U.S. and talks have commenced. The mission is to continue the discussions held in Djakarta last November; these concerned the tin contract which is on the point of expiration. The price of the 25,000 tons of tin sent each year under the existing contract was fixed by open market quotations. There have been rumours that the price of the metal delivered under the new agreement will be related to the movement of the American wholesale price index. No confirmation of this rumour has been obtained.

Mr. Manley Fleischmann has indicated that tin may have to be borrowed from the strategic stockpile to meet current requirements. This action will be avoided only if R.F.C. can make quick purchases for early delivery. Mr. Fleischmann declined to say where the U.S. was looking for such supplies, but he made it quite clear that the tin to be delivered under the U.S.-U.K. agreement would arrive too late to prevent the borrowing. The source favoured by many commentators as being the most likely is Indonesia, but unless tin concentrates have been shipped already they will not be in time. The Americans seem annoyed that the first deliveries of tin under the U.K. agreement were not fixed early enough and the British criticism that a little more resistance on the part of our negotiators would have led to more favourable terms seems to have gained weight.

Provisional estimates by the International Tin Study Group put world mine production for last year at about 164,500 tons, compared with 167,000 tons in 1950. Production in Malaya decreased from 57,537 tons in 1950 to 57,167 tons in 1951. Indonesian production at 30,984 tons showed a decrease of around 3,000 tons and the Belgian Congo at 1,923 a decline of some 1,500 tons. Bolivian exports, however, showed an increase of 2,000 tons at 33,131.

The Study Group provisionally estimates world consumption at 140,200 tons, a decrease of 5 per cent over the previous year. Of this total, the U.S.A. is credited with 61,500 tons, and the U.K., 24,300 tons. The gap between production and commercial consumption in 1951 thus appears to have been around 25,000 tons. No information is available as to how much of this has been absorbed by strategic stock piles.

ZINC.—Zinc in the U.S. continues to be so short that the American stockpile is to be raided for defence needs. The raid will consist of two parts: an actual withdrawal of 15,000 tons from the stockpile in the first half of the year, and the diversion of 14,000 tons, originally intended for the stockpile to industrial purposes. It is hoped that an improvement later in the year in imports into the U.S. would enable additions to the stockpile to be made. This hope will come nearer to realization when the bill suspending the import duties on zinc becomes law.

Meanwhile the D.P.A. has announced a target of 920,000 tons for annual domestic zinc production by 1955, an increase of nearly 30 per cent above the 1950 figure of 690,000 tons.

Reports from Canada tell of plans to build an electrolytic refinery in that country. Golden Manitou Mines is to undertake this work, costing $12,500,000. When the plant has been erected after a period of two years, it will have a capacity of 37,500 tons per annum; it is to be located in the St. Lawrence River area.

Ernest V. Gent, Vice-President of American Zinc Institute, has reviewed the American zinc industry in 1951. The production of slab zinc at U.S. smelters was about 2 per cent greater than in 1950. Imports of slab zinc were only 58 per cent of previous year, but stocks at the end of the year were 21,901 tons higher than at the beginning. The benefit to the domestic consumer is not clear, since part of this stock is earmarked for Government account and part is pledged for export. Mr. Gent forecasts that slab zinc capacity in 1952 will be in the region of 950,000 to 1,000,000 tons but supplies will naturally depend on supplies of concentrates and secondary material.

ANTIMONY.—Reports from New York state that the price of antimony ore (50-55 per cent) has been reduced 25c. to range between $5.00 and $5.25 per s.ton unit of 20 lb.

MAGNESIUM.—The Ministry of Materials has announced an increase in the price of virgin magnesium in ingot form. The new price is 2s. 10½d. per lb., delivered against 2s. 4½d. The reasons for this change are the higher costs of imported supplies and of delivery charges.

NICKEL.—The Manganese-Nickel-Cobalt Committee of International Materials Conference has issued the long-awaited allocation scheme for nickel. This scheme covers a wider range of primary nickel than that which operated in 1951; it now includes ferro-nickel, nickel cast iron and sintered oxide (matte). Because of this change no valid comparison can be made with the amounts available and allocated during the fourth quarter of 1951. The U.K. is to receive 5,170 tonnes of primary nickel for the first quarter of 1952; this amount will include any receipts under the interim plan which operated while the longer scheme was being worked out. Of the European countries, Germany's allocation is second to this country's being 1,240 tonnes. The total amount of primary nickel reckoned to be available in the quarter is 33,583 tonnes.

The authorities in Washington are, obviously, taking a pessimistic view of the future supply of nickel, since they have laid down a programme which will raise the supply in 1954 by 31 per cent over the 1950 level. Almost all of the increase will come from Canada and Cuba. It is hoped that the Canadian supply will expand from 87,400 tons in 1950 to 106,000 tons in 1954. Since the war the Wicaro project in Cuba has been closed, but it is re-opening this Spring and by 1954 D.P.A. hopes that it will be producing at the annual rate of 15,000 tons. It is admitted that the project will be high-cost.

SULPHUR.—The large discrepancy between supply and demand has given the U.S. sulphur producers a great stimulus. According to the Bureau of Mines, production of 5,278,000 l.tons in 1951 was a record, beating the figures for the previous year by roughly 2 per cent.

TUNGSTEN.—Although the wolfram price in the U.K. remains at 485s. c.i.f., there are rumours that business is being done above this level.

The London Metal Market

(From Our Metal Exchange Correspondent)

The price of tin both in London and in Singapore, except for a slight setback on Thursday of last week, showed a steadily rising tendency until Tuesday when cash and the forward positions were dealt in on the London Metal Exchange at over the £1,000 per ton mark. However, there was a sudden drop in Singapore on Wednesday of some £34 per ton, but as the London market remained closed because of the death of the King, it is not possible to gauge what the reaction here would have been.

The Indonesian Mission is now in Washington and was expected to commence negotiations in earnest on the 6th inst. The outcome will be awaited with considerable interest.

Prices for lead and zinc have shown a further reduction in the premium paid in the free market, the price of lead being £160/£165 per ton, and for g.o.b. zinc £210/£220 per ton, both c.i.f. Europe. The dollar price for lead is now based on the American quotation as there are no buyers in Europe, whilst the dollar price for zinc is 23c.-24c. per lb. The tonnage of copper available is very small and the price 45c.-46c. per lb. c.i.f., with no Sterling material available.

On Thursday the official close on the tin market was: Settlement price £996, Cash Buyers £996, Sellers £997 10s. Three months' Buyers £995, Sellers £997 10s. In the afternoon the market was steady. Turnover for the day was 120 tons. Approximate turnover for the week was 640 tons.

The Eastern price on Thursday morning was equivalent to £1,004 7s. 6d. per ton, c.i.f. Europe.

Iron and Steel

First impressions of the new system of steel allocations which came into operation on Monday last are not unfavourable. One of the faults of the previous control was that authorizations were issued in excess of the maximum capacity of the steel industry and the consequence was that at the end of each period there were heavy cancellations of uncompleted orders. The authorities appear to be determined not to repeat that mistake. Perhaps they have erred in other directions. Many consumers engaged on work of national importance express disappointment with their first allocations, but are mindful of the fact that these only cover the period up to the end of March and are hopeful of receiving better supplies in the second quarter of the year.

Already an assurance on these lines has been given to the cycle makers by the Minister of Supply who has promised an increased allocation "having regard to the substantial contribution which this industry is making to the export trade." Shipbuilders and engineers feel that they will receive no less favourable consideration as soon as circumstances permit. Much depends on the speedy arrival of the first shipments of steel from U.S.A. and Japan. When these are available the gap between supply and demand should be reduced to manageable proportions. Meanwhile no effort is being neglected to expand home production. Since there is no hope of increasing to any great extent the intake of foreign scrap, the industry is concentrating upon securing a bigger output of pig iron.

One difficulty has been eliminated. Arrivals of foreign ore have been on such a liberal scale that stocks are increasing. The coke position, however, is less satisfactory and will have to improve before more blast furnaces can be lighted up. Mills engaged on light sections, small bars, and sheets have an abundance of orders in hand, but are handicapped by the scarcity of billets, sheet, bars and slabs. Arrival of this material from France and Belgium has been on a slightly better scale since the turn of the year, but still larger tonnages of imported billets could be put to good account.

The Ministry of Supply has announced that from April 1 the separate allocation of non-alloy steel sheet will be abandoned. Thereafter consumers will be free to decide for themselves, within their total authorized tonnage, how much they wish to order in the form of non-alloy sheet steel, and how much in the form of other non-alloy steel (other than tin plate, terne plate and black plate which will remain subject to separate allocation as at present).

FEBRUARY 7 PRICES

COPPER

Electrolytic	£227 0 0 d/d

TIN

(See our London Metal Exchange report for Thursday's prices)

LEAD

Soft foreign, duty paid	£170 0 0 d/d
Soft empire, including secondary lead	£170 0 0 d/d
English lead	£171 10 0 d/d

ZINC

G.O.B. spelter, foreign, duty paid	£190 0 0 d/d
G.O.B. spelter, domestic	£190 0 0 d/d
Electrolytic and refined zinc	£194 0 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over	£365 per ton
Crude (70%)	£290 per ton
Ore (60% basis)	45/50s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade)	£454 per ton

OTHER METALS

Aluminium, £148 per ton.	Palladium, £8 10s. oz.
Bismuth, 28s. lb.	Platinum (scrap), £33.
Cadmium, 18s. 9d. lb.	Platinum, £27/33 5s. nom.
Chromium, 6s. 3d. lb.	Rhodium, £45 oz.
Cobalt, 20s. lb.	Ruthenium, £30 oz.
Gold, 248s. f.oz.	Quicksilver, £73 10s./£74 ex-warehouse.
Iridium, £65 oz. nom.	Selenium, 25s. nom. per lb.
Magnesium, 2s. 10½d. lb.	Silver (bar), 77d. f.oz. spot and forward.
Osmiridium, £35 oz. nom.	Tellurium, 19s. lb.
Osmium, £70 oz. nom.	

ORES, ALLOYS, ETC.

Bismuth	65% 18s. 3d. lb. c.i.f. 60% 17s. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (lumpy)	£13 per ton c.i.f.
,, ,, (concentrates)	£13 per ton c.i.f.
,, ,, Refractory	£12 12s. per ton c.i.f.
Baluchistan Metallurgical	£14 16s. per ton c.i.f.
Magnesite, ground calcined	£26 - £27 d/d
Magnesite, Raw	£10 - £11 d/d
Molybdenite (85% basis)	103s. 1½d. per unit c.i.f.
Wolfram (65%), U.K.	485s. nom. c.i.f.
Tungsten Metal Powder (for steel manufacture)	35s. nom. per lb. (home)
Ferro-tungsten	33s. nom. per lb. (home)
Carbide, 4-cwt. lots	£30 3s. 9d. d/d per ton
Ferro-manganese, home	£41 15s. 11d. per ton
Brass Wire	2s. 7½d. per lb. basis.
Brass Tubes, solid drawn	2s. 1d. per lb. basis.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

The death of His Majesty the King came as a great shock to members. Dealers immediately took down their boards and trading came to a standstill. The Council closed the House officially from 12 o'clock as a mark of respect. Not long ago the King honoured the House with a visit and many members will recall a smiling figure appearing on the rostrum above a packed floor. The sympathy of all members will go out to the Royal Family and especially to the young Queen now called upon to take up many additional and arduous duties. She herself also honoured the Stock Exchange with a recent visit.

Gilt-edged stocks fell away sharply following the announcement of a new Southern Rhodesian Government loan consisting of £7,500,000 4½ per cent stock 1977/82 at 99 per cent. This establishes a new level for long dated borrowing.

Many shorter dated gilt-edged securities having a coupon of 3 per cent or 3½ per cent now stand at considerable discounts. This offers large investors substantial capital gains over limited periods. There may be a swing in popularity towards this type of tax free profit rather than high coupon stock bearing tax at 9s. 6d. in the £ and possibly surtax as well. The result of the issue will be watched with interest.

Messina Transvaal, confirming last week's rumours, are to offer shareholders three new 5s. shares at £4 each for every 10 held. The existing shares eased to £5 on the news. Roan Antelope and Mufulira record substantial advances in their half-year's revenue figures. Roan's profits before tax are £4,232,000 against £2,695,000 and Mufulira £4,300,000 against £3,796,000. In spite of these good figures the market showed little response.

Revised taxation for new mines operating in Northern Rhodesia is expected to become law this year. The effect will be to allow the writing off of capital expenditure against operating profits. This is a realistic attitude towards mining companies which, of their nature, are bound to be wasting assets. U.K. taxation by contrast does not recognize this factor, and, by failing to do so, has driven many prosperous mining concerns overseas, representing a permanent loss to this country.

Rhodesia Katanga were active, and speculative buying raised them at one time to 12s. 6d., the highest price since 1937.

Diamond shares were in demand. De Beers jumped following the increased distribution by African Explosives and anticipation of improved figures. Anglo American Investment Trust raised their final dividend from 25 per cent to 40 per cent making a total distribution of 60 per cent for 1951 against 35 per cent last year. Profits after tax have risen by £541,000. Other diamond issues hardened in sympathy.

Kaffirs were generally better without showing any great enthusiasm. West Rand Investment Trust rose sharply following the increase in distribution bringing the total to 13½ per cent as against 11½ per cent last year. Estimated profits after tax show an increase of £94,000. This in turn aroused interest in Doornfontein, West Driefontein, and the West Rand Consols which all improved. Buyers came in for Grootvlei which should benefit if any change is made in taxation in the South African budget.

Cam & Motor announced that after full investigation they have exercised their option to buy the Pickstone mine for £200,000. It is situated about 17 miles from the Cam and Motor property.

Oil shares were again popular. Some substantial investment buying of Anglo-Iranian was reported from the market and Trinidad Leaseholds were also a prominent feature. Following a review in a leading financial paper concerning deep drilling prospects in Trinidad, most oil shares in this group hardened, particularly Apex and Trinidad Petroleum Development. While such a policy must be costly it is clearly essential for the well-being of the field. Should the existence of deep reserves be proved, it would be a big factor in the continuing life of leading companies in this colony.

FINANCE	Price Feb. 6	+ or − on week
African & European	2⅜	−⅛
Anglo American Corpn.	7⅜	−⅛
Anglo-French	20/9	−6d
Anglo Transvaal Consol.	33/9	+1/3
Camp Bird	12/3	+1½d
Central Mining (£1 shrs.)	38/9	+1/3
Consolidated Goldfields	48/1½	
Consol. Mines Selection	29/4½	−7½d
East Rand Consols	3/1½	−1½d
General Mining	4½	
H.E. Prop.	36/10½	
Henderson's Transvaal	13/3	+9d
Johnnies	3⅜	+⅛
Rand Mines	6	
Rand Selection	43/9	−7½d
Union Corporation	9½	+⅛
Vereeniging Estates	4½	+⅛
Writs	33/1½	+1/3
West Wits	44/4½	
RAND GOLD		
Blyvoors	42/1½	−1½d
Brakpan	18/-	
City Deep	45/-	
Consol. Main Reef	41/3	+1/3
Crown	3⅜	+⅛
Daggas	3⅛	+⅛
Dominion Reefs	2/3	
Doornfontein	25/7½	+10½d
Durban Deep	3½	+⅛
E. Daggas	21/10½	+7½d
E. Geduld ... (4/- units)	46/10½	+7½d
E. Rand Props.	3⅜	
Geduld	6½	+⅛
Grootvlei	33/3	+9d
Libanon	13/7½	
Luipaards Vlei	17/3	
Marievale	21/-	+4½d
Modderfontein B	5/6	+6d
Modderfontein East	30/-	
New Kleinfontein	32/6	+7½d
New Pioneer	16/9	
Randfontein	17/6	−4½d
Robinson Deep	13/-	+6d
Rose Deep	33/9	+1/3d
Simmer & Jack	6/6	+3d
Springs	9/-	
Sub Nigel	2⅛	+⅛
Van Dyk	14/6	−3d
Venterspost	22/3	−3d
Vlakfontein	17/-	
Vogelstruisbult	26/9	+3d
West Driefontein	6⅛	+⅛
W. Rand Consolidated	46/3	+1/3
Western Reefs	40/7½	+7½d

O.F.S.	Price Feb. 6	+ or − on week
Alpha F.S.A.	8/-	
Blinkpoort	20/-	
Central Mining F.S.	4/3	
Freddies	8/10½	+3d
Freddies N.	8/4½	−1½d
Freddies S.	9/4½	−1½d
F.S. Geduld	3⅜	−⅛
Geoffries	21/6	
Harmony	23/3	
Lydenburg Estates	10/3	−6d
Middle Wits	20/3	+3d
Msifa	42/6	+7½d
President Brand	17/6	−6d
President Steyn	15/6	−3d
St. Helena	20/9	+3d
U.F.S.C. & G.	8/3	
Virginia Deb.	73	
Virginia Ord.	11/7½	−3d
Welkom	34/4½	−7½d
Western Holdings (New)	3⅜	+⅛
WEST AFRICAN GOLD		
Amalgamated Banket	1/10½	
Ariston	6/7½	+1½d
Ashanti	25/3	+9d
Bibiani	8/6	
Bremang	2/10½	
G.C. Main Reef	3/3xd	−1½d
G.C. Selection Trust	7/6	+3d
Konongo	3/3	
Kwahu	4/1½	−1½d
London & African Mng.	1/9	
Lyndhurst Deep	1/1½	−1½d
Marlu	1/7½	
Nanwa	6d	
Taquah & Abosso	5/6	+3d
AUSTRALIAN GOLD		
Boulder Perseverance	2/7½xd	
Gold Mines of Kalgoorlie	11/9	
Great Boulder Prop.	8/-	
Great Western Consol.	5/9	
Lake View and Star	18/6	−3d
Mount Morgan	17/3	−3d
North Kalgurli	15/-	
Paringa	6d	
Sons of Gwalia	10/-	
South Kalgurli	8/6	
Western Mining	7/6	+3d
Wiluna	5/9xd	
MISCELLANEOUS GOLD		
Cam and Motor	36/3	
Champion Reef	8/6	
Falcon Mines	8/9	−3d
Globe & Phoenix	24/-	

MISCELLANEOUS GOLD (contd)	Price Feb. 6	+ or − on week
G.F. Rhodesian	6/10½	−1½d
London & Rhodesian	5/4½	+1½d
Motapa	2/-	
Mysore	5/-	
New Guinea	1/7½	
Nundydroog	6/6	
Ooregum	3/-	
Oroville	12/9	+3d
St. John d'El Rey	34/4½	+1/1½
Zams	41/6	+6d
DIAMONDS		
Anglo American Inv.	5⅜	+⅛
Casts	37/6	+2/3
Cons. Diam. of S.W.A.	4½	+⅛
De Beers Defd. Bearer	77/9	+3/-
De Beers Pfd. Bearer	14⅜	
COPPER		
Chartered	69/-	
Indian Copper	4/6	+6d
Messina	5	−⅛
Nchanga	8⅜	+⅛
Rhod. Anglo-American	70/9	+6d
Rhodesian Selection	21/10xd	+1½d
Rhokana	25⅜	−⅛
Rio Tinto	25	+1
Roan Antelope	15/3	+6d
Selection Trust	46/3	−7½d
Tanks	67/-	−6d
Tharsis Sulphur Br.	52/6	
TIN (Eastern)		
Anglo-Burma	3/-	
Ayer Hitam	28/9	+3d
Bangrin	10/7½	
Gopeng	16/4½	+3d
Hongkong	10/9	+3d
Ipoh	26/9	
Kamunting	12/10½	−1½d
Kepong Dredging	10/3	
Kinta Tin Mines	17/6	+3d
Kramat Pulai	4/9	
Malayan Dredging	23/6	−9d
Pahang	18/7½	+6d
Pengkalen	12/6	
Petaling	17/3	
Rambutan	16/10½	
Siamese Tin	25/4½	+1½d
Southern Kinta	17/4½	−1½d
S. Malayan	29/6	
S. Tronoh	22/6	+3d
Sungei Kinta	23/1½	
Tekka Taiping	11/3xd	
Tronoh	30/6	+3d

TIN (Nigerian and Miscellaneous)	Price Feb. 6	+ or − on week
Amalgamated Tin	11/1½	+1½d
Beralt Tin	25/9	
Bisichi	4/7½	
British Tin Inv.	19/7½	
Ex-Lands Nigeria	6/9	−1½d
Geevor Tin	16/6xd	+3d
Gold & Base Metal	4/1½	
Jantar Nigeria	7/6	−1½
Jos Tin Area	11/3	
Kaduna Prospectors	4/3	
Kaduna Syndicate	6/-	
London Tin	6/6	+1½d
Ribon Valley	1/3	
United Tin	3/1½xd	
SILVER, LEAD, ZINC		
Broken Hill South	53/6	−9d
Burma Corporation	3/7½	+1½d
Consol. Zinc	31/3	+3d
Lake George	22/6	
Mount Isa	42/-	
New Broken Hill	26/-	+3d
North Broken Hill	69/-	−3d
Rhodesian Broken Hill	20/-	−7½d
San Francisco Mines	33/3	+1/3
Trepca	3/4½	−1½d
MISCELLANEOUS BASE METALS & COAL		
Amal. Collieries of S.A.	50/-	
Associated Manganese	53/3	−2/9
Chinese Engineering	4/4½	
C.P. Manganese	52/-	−6d
Natal Navigation	3⅜	−⅛
Wankie	18/10½	+1/
Witbank Colliery	2⅞	
CANADIAN MINES		
Dome	$30	
Hudson Bay Mining	$123	−$1
International Nickel	$88	+$½
Mining Corpn. of Canada	£6⅝	
Noranda	$150	−$1
Quemont	£8⅛	−⅛
OIL		
Anglo-Iranian	6	+⅛
Apex	48/9	+7½d
Attock	24/4½	−1½d
Burmah	63/1½	+1/3
Canadian Eagle Bearer	33/3	+9d
Mexican Eagle	24/-	+1½d
Shell	4⅜	+⅛
Trinidad Leasehold	32/9	+2/-
T.P.D.	32/6	+6d
Ultramar	38/3	−3d

COMPANY NEWS AND VIEWS

Rand Selection Expands its Horizons

The report and accounts of Rand Selection Corporation should please shareholders. Not only was the year ended September 30 last a profitable one but also the corporation took the opportunity to expand its interests and broaden the basis of its activities.

Although the corporation is primarily considered as a finance company in the Anglo-American group, interested principally in mines on the Rand and in the O.F.S., it also owns town and other property in South Africa. The gross revenue for the year comprising revenue from dividends, interest, townships, share dealings, etc., amounted to £879,540 (£697,787) and income from the sale of freehold property of £30,400 (Nil), totalled £909,940 against £697,787 in the preceding year. Expenses were higher, largely due to a full year's interest being required on the company's 4½ per cent, ten year unsecured loan stock, amounting to £1,000,000 which required £45,000 as compared with £3,945 previously. Taxation more than doubled, £130,000 against £60,000 being required, but this did not prevent the payment of 40 per cent on the 5s. shares for the ninth year in succession. The maintenance of the dividend at this level was, however, more impressive than it appears at first sight, as it is payable on a capital increased by £493,393 to £1,618,993 brought about by the acquisition of over 80 per cent of the shares in South African Townships, Mining and Finance Corporation, formerly an associate company, but now a subsidiary. The carry-forward at the fiscal year end amounted to £364,502 against £317,206 brought in.

During the year, in addition to its acquisition of shares in South African Townships, the corporation extended its existing agreement with the Anglo American Corporation of South Africa whereby it was entitled to participate in new business, taken up by the Anglo American Corporation, from October 1, 1954, to October 1, 1960, and, by virtue of the same agreement Rand Selection extended its interest in such new business from 25 per cent to 30 per cent. In return for these services Anglo American Corporation was given the right, exercisable on or before March 31, 1954, to take up 400,000 reserve shares of 5s. each, at 45s. per share.

The latest balance sheet records the above mentioned transaction and also reveals a sharp advance in debenture holdings from £172,140 to £400,665 and of loans to associated companies from £26,522 to £241,930, giving a total figure of £642,595 against £198,662 previously. With the O.F.S. in its present critical stage of development it may be assumed that the Orange Free State Mines in the corporation's portfolio have been the ones to benefit.

S.A. Townships: Nine Months' Results

The majority of shareholders of South African Townships, Mining and Finance Corporation having accepted the offer made by Rand Selection Corporation in February, 1951, to acquire their shares, S.A. Townships has now become a subsidiary of Rand Selection Corporation and as such, must close its accounts each year on the same date as that corporation, namely, September 30. Thus the report and accounts under review cover the nine month period to September 30 last as compared with the previous twelve months.

The profit and loss account for the nine months ended September 30, 1951, showed gross revenue at £135,477 (compared with the previous full year's revenue of £181,611), of which dividends accounted for £34,471 and profit on share dealings for £82,968, the balance, £18,038, being mainly derived from sales of township stands and small holdings, interest, etc. Although the income from dividends does not measure up to the previous year's revenue from this source of £87,099, it should be remembered that the accounts under review do not include dividends from companies whose distributions are made in December. Expenses were virtually the same as were the taxation liabilities, which amounted to £4,331 against £4,700 and net profit, after these charges had been provided for, was £99,298 compared with £141,891 for the preceding twelve months. The dividend distribution of 3½ per cent or 4½d. per 10s. share, was equivalent to 5 per cent in a full year, the same as was paid last year. The carry forward at the end of the period was slightly higher at £201,398 against £193,800.

Mr. H. C. Koch, chairman, in his statement to shareholders pointed out that the corporation still maintained its interest in the Orange Free State gold mines, mainly through its large holding of Orange Free State Investment trust shares. Additionally, at Sept. 30 last S.A. Townships could count among its principal shareholding interests the two Presidents, Steyn and Brand, Loraine, Free State Geduld and Welkom.

Roan and Mufulira's Expansion Programmes

Although the results of the year ended June 30, 1951, of both Roan Antelope Copper Mines and Mufulira Copper Mines has been known for nearly two months, the full reports and accounts of these companies now published gives interesting details of their respective expansion programmes.

Mufulira Copper Mines, in which Rhodesian Selection Trust hold a 64 per cent interest, is planning to double its electrolytic production from 36,000 tons to 72,000 tons per annum by 1954. The projected expansion is expected to bring the total cost of the electrolytic refinery to £3,000,000. At June 30 last, total appropriations towards the cost of the refinery amounted to £2,000,000 and it is proposed to find the remaining £1,000,000 by the allocation of £500,000 for this purpose in each of the next two years. Furthermore, the Company have plans in hand for simultaneous mass caving of all three orebodies below the 1,150 ft. level. This formidable development programme will, of course, involve an extension to the mill and this is now under consideration. Subsequently, the present milling rate, which is 285,000 tons per month, will be raised to 340,000 tons per month by 1956. The capital cost of this mill and other modifications, expected to be about £1,175,000, will be financed from the company's internal resources.

Roan Antelope is also planning to increase its copper production. The programme envisaged is to raise production from its present monthly output rate from approximately 6,200 tons of copper per month to 8,000 tons per month and the cost of the mill extension which this will involve will also be financed from internal resources.

Mr. R. L. Prain, chairman of both companies, also gives details of the steps which both companies are taking to ensure their longer term viability. Both companies, in conjunction with the British South Africa Co., have decided to take up exclusive prospecting licences over large areas in Northern Rhodesia. While this decision was due in part to the feeling that these areas were potentially suitable for exploration by modern geophysical methods, the move was also strongly encouraged by the favourable taxation proposals now tabled by the Northern Rhodesian Government. Under the new proposals, which are expected to become law this year, new mines will normally be allowed, in effect, to write off their initial capital expenditure out of profits before taxes become payable. Thereafter, all capital expenditure in any year will be allowed as an operating cost. Mr. Prain describes these enlightened measures as "the ideal sort of legislation for a country like Northern Rhodesia . . ."

Further evidence that the group intends to widen its mining horizons wherever opportunity affords is the work which is now being carried out on Mufulira's Baluba copper-cobalt property, which was discovered in 1929 and is estimated to contain between 19,000,000 and 37,000,000 tons of ore, depending upon the point at which the cut-off grade is determined. If current drilling results prove satisfactory, it is intended to form, later this year, a new company to be known as Baluba Mines, Ltd. In this event the capital expenditure required might be as much as £9,000,000-£10,000,000. This will be considerably greater than the amount required for the exploitation and development of the company's Chibuluma prospect which is being developed with the view to coming into production by 1956. In this case, however, the funds for its financing, which are being raised by Mufulira and the E.C.A., will be appreciably smaller.

Accompanying the Annual Report of Mufulira and Roan Antelope are the companies' quarterly reports which show that in the first six months of the current year profits in both cases showed a substantial improvement over the corresponding period of the previous year. Estimated profit of Mufulira, before tax, for the half-year amounted to £4,300,000 against £3,796,000; while Roan's profits, before tax, amounted to £4,232,000 against £2,695,000 in the first six months of 1950-51.

The table shows below the December quarter's sales and profits together with those of the September quarter and a comparison of the first six months of 1950 and 1951 is also given.

Mufulira	*September Quarter*	*December Quarter*	*6 months to December*	
	(1951)	(1951)	(1951)	(1950)
Sales ..... l.tons	16,918	21,528	38,446	41,118
	(£000)	(£000)	(£000)	(£000)
Revenue.....	3,434	4,379	7,813	6,735
Costs	1,452	1,782	3,234	2,778
Difference in value of copper stocks.....	cr223	cr47	cr270	cr231
Surplus	2,205	2,644	4,849	4,188
London Expenses.....	24	25	49	42
Replacements*	175	325	500	350
Profit before taxation	2,006	2,294	4,300	3,796

*Subject to revision when year's accounts considered.

Roan Antelope	*September Quarter*	*December Quarter*	*6 months to December*	
	(1951)	(1951)	(1951)	(1950)
Sales ..... l.tons	19,902	21,249	41,151	35,648
	(£000)	(£000)	(£000)	(£000)
Revenue.....	4,040	4,323	8,363	5,904
Costs	1,652	1,865	3,517	2,837
Difference in value of copper stocks.....	cr35	cr47	cr82	cr38]
Surplus	2,423	2,505	4,928	3,205
London Expenses.....	35	36	71	60
Replacements*	225	400	625	450
Profit before taxation	2,163	2,069	4,232	2,695

*Subject to revision when year's accounts considered.

Company Shorts

New Mining Company Formed in Northern Rhodesia.—A statement issued this week by Rhokana Corporation, Mufulira Copper Mines, Roan Antelope Copper Mines and the British South Africa Company announces the incorporation in Northern Rhodesia of Chisangwa Mines with an authorized share capital of £200,000 of which it is intended that £100,000 will be issued shortly. The capital to be issued will be subscribed in cash at par as to 30 per cent each by Mufulira, Rhokana Corporation, Ltd. and Roan Antelope Copper Mines, Ltd. and as to 10 per cent by The British South Africa Co.

The first Directors are: Mr. L. Tucker (chairman), Mr. O. B. Bennett, Mr. W. Marshall Clark, Mr. H. St. L. Grenfell, Mr. A. B. MacLaren, Mr. John Payne, Jnr., Mr. Jack Thomson.

The new company will carry on prospecting work hitherto performed by Mufulira Copper Mines, Ltd., on behalf of itself and the other three shareholders, in what has been known as the "Western Concession" area in Northern Rhodesia. The Concession adjoins the western boundary of the Copperbelt and has an area of approximately 3,700 square miles.

Uruwira M.S.A. Loan, Repayable in Lead and Copper.—With reference to the note in these columns last week, regarding the U.S. Government financing of the installation of a production mill at Uruwira, it is now announced that the Mutual Society agency loan of $U.S.1,640,000 plus 5 per cent interest is to be repaid in deliveries of lead and copper to begin not later than January 1, 1954 and to be completed by December 31, 1956. Under the agreement the company will be bound to offer not less than 11-16ths of its annual production of copper and lead to the U.S. Government, the remaining 5-16ths being saleable on the free market. The contract gives the U.S. an option to purchase up to 50 per cent of the total lead and copper production for ten years after the advance and interest have been repaid.

Uruwira is to spend an additional £325,000 on the mine expansion and the dollar advance will be used for American mining equipment and services, additional equipment being obtained from the Sterling Area. Altogether Uruwira plans to spend the equivalent of £1,170,000 in dollars and sterling.

Messina Offers Three for Ten at £4 per Share.—The Messina (Transvaal) Development Company has announced that at an extraordinary general meeting called for February 26, in Johannesburg, the company will propose the offer of 300,000 5s. reserve shares at £4 per share in the proportion of three new shares for every ten units of stock held.

A circular issued to shareholders recalls the chairman's statement at the annual meeting on March 15, 1951, when he referred to the company's general policy of widening the scope of its activities and in particular to the work at its Artonvilla property and to its interest in Rhodesian Copper Ventures. Since that date the company has obtained an option over and is prospecting and developing a block of copper claims known as Umkondo property in the Fort Victoria district in Southern Rhodesia.

The directors estimate that not less than £1,200,000 should now be provided to increase production at Artonvilla, develop the Umkondo claims and provide the company's share of the funds required to develop the property of Rhodesia Copper Ventures. This amount, the directors state, will be raised by the proposed offer and they add that the new shares will rank *pari passu* with existing stock and for all future dividends other than dividend No. 4 which will be declared this month.

Anglo-French Exploration, Johannesburg Consolidated Investment and New Consolidated Gold Fields have agreed to underwrite the proposed issue for a cash commission of 1s. 6d. per share. It is estimated that the total of the expenses in connection with the issue will be £24,750. The consent of the U.K. Treasury has been obtained for that portion of the issue open to stockholders on the London Register.

The 5s. shares of Messina at their current price of approximately £5 would make the "rights" worth about 4s. 6d. per share.

Lucas Block Borehole Give 876 in.-dwt.—Anglo-Transvaal Consolidated and Strathmore Consolidated have announced that in a deflection of borehole B.U.5 the Vaal Reef was intersected at a depth of 8,249 ft. assaying 59.6 dwt., over a correct width of 14.7 in. equivalent to 876 in.-dwt. Core recovery was complete and no further deflections will be made. It will be recalled that the original hole, which is in the Lucas Block on farm Buffelsfontein 75, in the Klerksdorp district

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approximately 5,300 ft. south-east of borehole B.U.3, gave 382 in.-dwt., from an almost complete core.

The hole was drilled by Middle Wit on behalf of itself and *New Pioneer. Other companies interested are Anglo-Transvaal* Consolidated, Strathmore Consolidated, Eastern Rand Extension, Southern Van Ryn Reef and Alpha Free State Holding.

Kenya Consolidated—Winding Up to be Considered.—Kenya Consolidated Goldfields will hold an extraordinary meeting on February 14 at Kericho, Kenya, to consider future policy and the advisability of placing the company into voluntary liquidation. During the year ended May 31, 1951, the company experienced a loss of £3,113 which brings the total debit balance to £284,319.

New Monteleo to Offer Three for Five.—New Monteleo has *announced that shareholders registered on February 1 will be* offered three 5s. shares in Natal Coal Exploration at a price of 5s. 6d. per share for every five held in New Monteleo. The *consent of the U.K. Treasury has not yet been obtained to* that portion of the issue open to holders on the London Register.

Geldenhuis Deep.—*This company has announced that it is* prepared to issue new sheets of coupons (Nos. 81/110) in exchange for talons detached from share warrants to bearer.

Mr. Basil Edwin Humphrey has been appointed director of Amalgamated Collieries of South Africa and **Mr. M. Ramsay** *has resigned.*

Mr. William Stanley Robinson, until recently president of the Consolidated Zinc Corporation, has been awarded the *Institute of Metals (Platinum) Medal in recognition of his* outstanding services to the non-ferrous metal industries in developing the Australian zinc-lead industry and the British *zinc industry.*

Mr. M. H. Spieler has been appointed an Assistant Manager in London of Union Corporation.

Mr. C. F. S. Taylor *has been appointed a director of Roan* Antelope Copper Mines.

Mr. Michael Thomas Wastell Easby has joined the board of *Zambesia Exploring.*

Mr. D. E. Webb has resigned from the board of Kalgoorlie Electric Power & Lighting Corporation.

W. E. SINCLAIR, M.I.M.M.
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THE BRITISH ALUMINIUM CO., LTD. have vacancy for qualified geologist aged 23-30 for survey work in Far East. Three year engagement in first instance. Previous field experience desirable but not essential. Good salary and allowances. Applications to Director in Charge of Establishment, The British Aluminium Co., Ltd., Norfolk House, St. James's Square, London, S.W.1.

RAND SELECTION CORPORATION, LIMITED

(Incorporated in the Union of South Africa)

ABRIDGED REPORT OF THE DIRECTORS for the Year ended 30th September, 1951

CAPITAL—During the year the following changes took place in the capital of the Corporation:—
(a) The Authorised Capital of the Corporation was increased from £1,250,000 in 5,000,000 shares of 5s. each to £2,000,000 in 8,000,000 shares of 5s. each.
(b) The Issued Capital of the Corporation was increased to £1,618,993 5s. in 6,475,973 shares of 5s. each by the issue of 1,975,973 shares to shareholders in South African Townships, Mining and Finance Corporation, Limited, in exchange for their shares in that Corporation, in the ratio of one Rand Selection share for every two South African Townships, Mining and Finance Corporation, Limited, shares. The South African Townships, Mining and Finance Corporation, Limited, shares acquired in this manner are shown in the Balance Sheet at the price of 20s. per share, and the 1,975,973 shares in your Company which have been issued during the year are therefore deemed to have been issued at the price of 40s. per share resulting in a premium of 35s. per share or £3,457,953, which has been transferred to the Appropriation Account.

LOAN FACILITIES—During the year an agreement was negotiated with Anglo American Corporation of South Africa, Limited, in terms of which Anglo American Corporation agreed to make available to your Corporation loan facilities up to £1,000,000 carrying interest at current South African bank rate with a minimum of 3 per cent per annum. These facilities are available up to and including the 31st March, 1954.

The period of the existing agreement between your Corporation and Anglo American Corporation of South Africa, Limited, whereby your Corporation is entitled to participate in new business taken up by Anglo American Corporation was extended by virtue of the same agreement from 1st October, 1954, to 1st October, 1960, and your Corporation's interest in such new business increased from 25 per cent to 30 per cent of Anglo American Corporation's net participation. In consideration for these services Anglo American Corporation of South Africa, Limited, was given the right, exercisable on or before 31st March, 1954, to take up 400,000 of the reserve shares of 5s. each in your Corporation at a price of 45s. per share.

PROPERTY—**Freehold and Mineral Rights**—During the year surface rights in respect of an area of approximately 186 morgen on the farm Rietfontein No. 8, not required for mine surface development, were disposed of at a satisfactory price. There were no other changes in the items appearing under these headings in last year's report.

Townships—As at 30th September, 1951, the Corporation had 1,174 stands for sale in Pollak Park, Selcourt, Selection Park and Brenthurst Extension No. 1 Townships. Amounts due to the Corporation on stands sold, which, in accordance with its usual practice, are not taken into account until collected, totalled approximately £45,000.

SHARES IN SUBSIDIARY COMPANY—During the year, as a result of the offer made to shareholders of South African Townships Mining and Finance Corporation, Limited, your Corporation acquired 3,951,946 South African Townships shares in exchange for 1,975,973 shares in your Corporation. An additional 3,828 shares were purchased for cash and the total holding at 30th September, 1951, was thus 3,955,774 shares. This represents approximately 82 per cent of the issued capital of South African Townships, Mining and Finance Corporation, Limited, which is therefore now a subsidiary company of your Corporation.

The principal shareholdings of South African Townships, Mining andFinance Corporation, Limited, are in: African Gold and Base Metal Holdings, Limited; Anglo American Investment Trust, Limited; Anglo American Prospecting Company, Limited; Durban Roodepoort Deep, Limited; Free State Geduld Mines, Limited; General Box Company, Limited; Loraine Gold Mines, Limited; Orange Free State Land and Estate Company (Proprietary) Limited; Orange Free State Investment Trust, Limited; President Brand Gold Mining Company, Limited; President Steyn Gold Mining Company, Limited; Rand Leases (Vogels) Gold Mining Company, Limited; Vaal Reefs Exploration and Mining Company, Limited; Vlakfontein Gold Mining Company, Limited; Welkom Gold Mining Company, Limited; Western Ultra Deep Levels, Limited.

SHARES AND INTERESTS IN OTHER CONCERNS—Your Corporation's other principal interests are in the following companies: American Anglo-Transvaal Investment Corporation, Limited; Anglo American Investment Trust, Limited; Anglo American Prospecting Company, Limited; Brakpan Mines, Limited; Central Mining Free State Areas, Limited; Daggafontein Mines, Limited; East Daggafontein Mines, Limited; First Electric Corporation of South Africa, Limited; Free State Geduld Mines, Limited; Grootvlei Proprietary Mines, Limited; Hard Metals, Limited; Industex, Limited; Loraine Gold Mines, Limited; Orange Free State Land and Estate Company (Proprietary) Limited; Orange Free State Investment Trust, Limited; President Brand Gold Mining Company, Limited; President Steyn Gold Mining Company, Limited; Rhodesian Alloys, Limited; Rhodesian Anglo American, Limited; South African Mines Selection, Limited; Springs Mines, Limited; Tanganyika Concessions, Limited; The South African Land and Exploration Company, Limited; Vaal Reefs Exploration and Mining Company, Limited; Vlakfontein Gold Mining Company, Limited; Vogelstruisbult Gold Mining Areas, Limited; Welkom Gold Mining Company, Limited; West Rand Investment Trust, Limited; Western Holdings, Limited; Western Ultra Deep Levels, Limited.

The market value of the assets comprised under this heading at the 30th September, 1951, taking Stock Exchange quotations where available, and Directors' valuation (but not above cost) in other cases, was £10,293,867 as compared with the figure of £4,116,386, at which they appear in the Balance Sheet.

FINANCE—Profit for the year ended 30th September, 1951	£829,916	
Unappropriated profit brought forward from 1950	317,206	
Premium on shares, less new share issue expenses	3,447,677	
		£4,594,799
From which the following appropriations have been made:		
Provision for taxation	£130,000	
Dividend No. 74 of 40 per cent (2s. per share)	647,597	
Directors' special remuneration	2,700	
General Reserve	3,450,000	
		4,230,297
Balance unappropriated, 30th September, 1951		£364,502

DIVIDEND—Dividend No. 74 of 40 per cent, equal to 2s. per share, in respect of the Corporation's financial year ended 30th September, 1951, was declared on the 29th November, 1951.

COPIES OF THE FULL REPORT AND ACCOUNTS OF THE CORPORATION, AND THOSE OF SOUTH AFRICAN TOWNSHIPS, MINING AND FINANCE CORPORATION, LIMITED, MAY BE OBTAINED FROM THE LONDON OFFICE, 11, OLD JEWRY, E.C.2.

ROAN ANTELOPE COPPER MINES LTD.

The following is an abridgment of the Statement of the Chairman, **Mr. R. L. Prain, O.B.E.** dated 8th January, 1952, circulated to the Members.

After dealing with the results for the year, the Company's participation in the prospecting of new areas in Northern Rhodesia, and certain new changes which are proposed in the Northern Rhodesian tax laws as affecting new mines, Mr. Prain stated:—

Representations have been made through the British Overseas Mining Association to the Millard-Tucker Committee and to the Royal Commission on Taxation with a view to presenting the case of the industry and of trying to impress on these bodies the points on which the mining industry differs from most other industries. While it is too early to say what effect these representations may have, it is a matter for regret that one has to record that, after several years of such representations to various Government Departments, the overseas mining industry here has yet to obtain from the British Government any real recognition of its case. Unless this case is recognized, it is beyond question that the overseas mining industry, which for so many generations has been centred in London, will wither and fade away altogether. The high rates of capital expenditure which mining requires to-day, the lower grade ores which it will be increasingly necessary to mine, and the high rates of taxation, make mining altogether too hazardous an undertaking to organize except in countries where the position of the mining industry is specially recognized.

POSITION AT MINE

The Irwin Shaft came into operation as a main hoisting shaft in the latter half of 1951; mine production is now coming from both the Roan Basin and Roan Extension areas.

A greatly increased tonnage was hoisted and treated through the mill. It is estimated that this tonnage can be still further increased, and planning is now on the basis of treating 5,000,000 tons annually through the mill, entailing the addition of certain further mill equipment and the mining of some ore of lower than normal grade. This programme is expected to increase production to 8,000 tons of copper per month by 1954. It will not be possible, of course, to maintain this rate throughout the remainder of the life of the Mine which, on present indications, will be 1971.

During the current financial year, if it were not for shortage of fuel, it is estimated that we could produce at least 84,000 l.tons of blister copper, but of course actual production will depend on fuel availability. Output in the first six months of the year, July to December inclusive, was 41,150 l.tons.

Fuel shortage, due sometimes to the railways' lack of sufficient rolling stock, and at other times to inadequate production at Wankie Colliery, has been a problem to us ever since 1945. The past year has seen little improvement in the situation, and during 1951 not much more than half of the Copperbelt's total fuel requirement was received in the form of Wankie coal.

DOMICILE

The problem of the domicile of the Company has continued to engage the attention of the Board during the year.

Briefly, it may be said that there are two factors which influence a decision on domicile. The first may be called economic and the second political. From the economic angle it is possible to save taxes by controlling companies such as ours from abroad. Until the Finance Act of 1951, we, in common with other companies, had been free to move control in this way ever since the incorporation of the Company some 25 years ago. It is true to say, I think, that a move at any time during these 25 years would have resulted in some saving of taxes paid by the Company. That we did not choose to change the control of the Company was due to a number of factors, which I need not go into here but, generally speaking, to the overriding feeling that taxes alone should not be allowed to determine so important a question as the seat of control of the Company.

This outlook had, of course, to be critically examined when the disparity in taxes became as wide as it has in the last two or three years. A change of domicile would now effect impressively large savings in taxes for the Company and hence indirectly for all its stockholders. Nevertheless, your Board still feels that political and administrative considerations outweigh the element of taxes.

You will agree, I am sure, that a company such as ours cannot act exclusively from motives of commercial self-interest; it is bound also to take into account national and imperial requirements. In the light of this principle your Board intends to keep the question under continuing examination. Events appear to be moving rapidly toward a shift in the centre of political gravity for Northern Rhodesian affairs from the United Kingdom to Rhodesia. Such a change in the political picture may well create conditions under which we should consider it our duty both to our stockholders and to our country of production, and indirectly to the Commonwealth, to seek to locate our seat of control in Central Africa.

MUFULIRA COPPER MINES LIMITED

The following is an abridgemnt of the Statement of the Chairman, **Mr. R. L. Prain, O.B.E.,** dated 8th January, 1952, circulated to the Members.

After dealing with the results for the year and the progress made in the construction of the Electrolytic Refinery at the mine, Mr. Prain stated:—

CHIBULUMA AND BALUBA

Chibuluma Mines Limited was formed as a subsidiary of Mufulira for the purpose of developing and working the Chibuluma copper-cobalt orebody with indicated reserves of 7,300,000 tons of ore, running 5.23 per cent copper and 0.25 per cent cobalt. Arrangements were entered into with the Economic Co-operation Administration whereby Mufulira would subscribe £600,000, in order to take up the ordinary share capital of Chibuluma Mines Limited and the E.C.A. would provide up to £3,000,000 in the form of an unsecured loan, repayable in metals in due course.

Development is now proceeding at the Chibuluma Mine with a view to getting into production by 1956. It is expected that it will produce copper at the rate of about 16,000 l.tons per annum, and cobalt at a rate estimated at about 500,000 lb. per annum.

Mufulira includes among its Special Grants one called Baluba. This orebody is estimated to contain between 19,000,000 and 37,000,000 tons of ore, depending on the point at which the cut-off grade is determined. Consideration will be given to the formation of a company to be known as Baluba Mines Limited for the exploitation of this mine as soon as possible. It is anticipated that on the basis of a mine production of 1,300,000 tons per annum, giving a copper production of about 24,000 tons per annum and a cobalt production estimated at about 1,100,000 lb. per annum, the capital might be of the order of £9,000,000 or £10,000,000. Ways and means of finding this finance are under consideration.

PROSPECTING

Prospecting continued throughout the year on the Special Grants of the Company.

It was decided, in conjunction with Roan Antelope Copper Mines Ltd. and The British South Africa Company, to take up exclusive prospecting licences over three large areas in Northern Rhodesia, and accordingly three new companies were formed, namely, Mwinilunga Mines Ltd., Kadola Mines Ltd. and Luapula Mines Ltd., owned as to 45 per cent each by this company and Roan Antelope and as to 10 per cent by The British South Africa Company.

During the year prospecting continued with interesting indications on the so-called Western Concession in which this Company, Roan Antelope, Rhokana Corporation and The British South Africa Company are jointly interested, and a company is being formed to continue this exploration. It will be known as Chisangwa Mines Ltd. and the shareholders will be the same as the present participants in the Western Concession area.

MINING TAXATION

Discussions with the Northern Rhodesian Government have led to the tabling of legislation which will provide for a change in those sections of the law which deal with the treament of capital expenditure on mines. Briefly, under the new proposals, new mines will normally be allowed in effect to write off their initial capital expenditure out of profits before taxes become payable. Thereafter, all capital expenditure in any year will be allowed as an operating cost. This brief statement somewhat oversimplifies the actual procedure, but the net effect is that these laws, which follow somewhat the laws of the Union of South Africa, will create a new incentive to the developing of mines in the territory, and especially of low-grade propositions or those which involve a high degree of capital expenditure.

GENERAL

Mr. Prain then referred to the position at the mine and the problems arising from the shortage of fuel on the Copperbelt. After stating that the question of the Company's domicile had continued to engage the attention of the Board during the year, he concluded:—

At present the atmosphere on the Copperbelt is one of prosperity, expansion and new development. A dynamic spirit infuses this remote corner of the Empire, combined with a consciousness of the key role which the Copperbelt has come to play in Imperial affairs. This is not to deny that there are clouds on the horizon. The gravity of the fuel problem and the uncertainty of the political future are factors which give cause for concern and are largely beyond the power of your Board to influence. I cannot believe, however, that human ingenuity will fail to find an early solution to the fuel problem or to devise a formula which will satisfactorily ease the growing inter-racial tension and lay a foundation for Northern Rhodesia's future relations with other African territories.

ANGLO-TRANSVAAL CONSOLIDATED INVESTMENT CO. LIMITED

Mining Companies' Directors' Reports for Quarter Ended 31st December, 1951

Following are the reports on work done during the quarter ended 31st December, 1951

ANGLO-TRANSVAAL COLLIERIES, LIMITED

The Sales Output of the Subsidiary Collieries controlled by this Company for the Quarter ended 31st December, 1951, totalled **258,473** tons.

EASTERN TRANSVAAL CONSOLIDATED MINES, LIMITED

The total tonnage treated during the Quarter ended 31st December, 1951, by the four gold mines operated by this Company amounted to **53,730** tons, resulting in a working profit (including Sundry Revenue) of **£47,251** for the Quarter.

Revenue from the sales of gold at higher than standard prices, sold for manufacturing purposes during the three months ended December, 1951, amounted to **£16,817** making a Total Profit for the Quarter of **£64,068.** The Profit, as shown above, does not take into consideration the amount, estimated at **£26,250** for the Quarter, payable to the Government in Mining Taxation. Capital Expenditure for the Quarter amounted to **£8,482.**

SHAFT SINKING

NEW CONSORT—The Prince Consort sub-vertical Shaft was sunk **229** feet during the Quarter to a total depth of **1,844** feet.
SHEBA—The Zwartkopje Shaft was sunk **5** feet during the Quarter to a total depth of **1,737** feet.
GENERAL—The Ben Lomond Tunnel was advanced **393** feet during the Quarter to a total length of **3,400** feet.

MERRIESPRUIT (ORANGE FREE STATE) GOLD MINING COMPANY, LIMITED

SHAFT SINKING

No. 1 VERTICAL SHAFT was sunk **648** feet during the Quarter to a total depth of **2,585** feet. The formation traversed was Ventersdorp Sediments. In addition, **2,664** cubic feet were excavated at a depth of **2,565** feet for a ventilation duct to serve the first station. The shaft was concrete lined to a depth of **2,567** feet of which **675** feet were accomplished during the Quarter. The intersection in pilot holes of water bearing fissures, requiring cementation, considerably delayed shaft sinking operations during the Quarter.

No. 2 VERTICAL SHAFT—No sinking work was done during the Quarter.

SHAFT EQUIPMENT—Work was commenced on the erection of the 750 H.P. single-drum service hoist at No. **1** Shaft.

REDUCTION PLANT—It has been decided that the Reduction Plant will be sited at the Merriespruit Mine and that its commencement will be deferred until the Mine has reached a more advanced stage. In these circumstances, arrangements have been made for the Virginia Mine to take over for its own account the **25,000** tons per month unit which was commenced for the Merriespruit Mine, in conjunction with the erection of a similar unit for the Virginia Mine, on a site in the vicinity of No. **1** Shaft, Virginia.

LABOUR—The Labour strength at the end of the Quarter was: Europeans **56;** Natives **496.**

CAPITAL EXPENDITURE—Capital Expenditure amounting to **£213,640** was incurred during the Quarter on shaft sinking, buildings and plant. This amount includes **£121,491** incurred by Virginia Orange Free State Gold Mining Company, Limited, on joint Capital Expenditure. The total Capital Expenditure, including preliminary expenses, incurred to 31st December, 1951, amounted to **£2,127,215.**

VIRGINIA ORANGE FREE STATE GOLD MINING COMPANY, LIMITED

SHAFT SINKING

No. 1 VERTICAL SHAFT was sunk **381** feet during the Quarter to a total depth of **3,419** feet. The formations traversed were Ventersdorp Sediments to a depth of **3,226** feet, and Quartzites of the Upper Witwatersrand System from this depth. The Big Pebble Conglomerate of the Gold Estates horizon was intersected between depths of **3,319** feet and **3,349** feet, with negligible values. In addition, **34,884** cubic feet were excavated in the cutting of the first station at a depth of **3,170** feet. The shaft was concrete lined to a depth of **3,387** feet of which **414** feet were accomplished during the Quarter.

No. 2 VERTICAL SHAFT was sunk **85** feet during the Quarter to a total depth of **2,909** feet. The formation traversed was Quartzites of the Upper Witwatersrand System. The Big Pebble Conglomerate of the Gold Estates horizon was intersected between depths of **2,840** feet and **2,845** feet, with negligible values. In addition, **44,208** cubic feet were excavated in the cutting of the first station at a depth of **2,860** feet. Shaft sinking was stopped temporarily during the Quarter to permit of development being commenced from this station. Development operations in progress consist of station layout, crosscutting to reef and vertical winzing to reef below the present shaft bottom. The shaft was concrete lined to a depth of **2,900** feet of which **114** feet were accomplished during the Quarter. The intersection in pilot holes of water-bearing fissures, requiring cementation, considerably delayed sinking operations in both No. **1** and No. **2** Shafts.

DEVELOPMENT—Development operations at No. **2** Shaft were commenced on 3rd December, 1951, and development at No. **3** Shaft was suspended during October to permit of the change-over to permanent hoisting arrangements. A total of **2,329** feet of development was accomplished during the Quarter, of which **634** feet were advanced at No. **2** Shaft, and **1,695** feet at No. **3** Shaft. The **634** feet advanced at No. **2** Shaft were wholly in country rock.

Of **1,695** feet advanced at No. **3** Shaft, **1,199** feet were on reef occupying the horizon of the Leader-Basal Group. Of the footage on reef, **1,150** feet were sampled, of which **240** feet, equal to **20.9** per cent, were classed as payable having an average value of **14.3** dwts., over a channel width of **20** inches equivalent to **286** inch-dwts. (The above results are based on actual sampling. No allowance has been made for adjustments necessary in the valuation of the corresponding Ore Reserve.)

SHAFT EQUIPMENT

No. 1 SHAFT—Good progress was made on the erection of the permanent headgear and work on the erection of the permanent winder-house has been commenced. **No. 2 SHAFT**—A dynamic braking system was installed on the 750 H.P. Hoist. An additional 30 inch ventilation column, a 10 inch pump column and electric cables were installed in the shaft. **No. 3 SHAFT**—The change-over to the permanent hoisting arrangements is nearing completion. Work is proceeding on the sillage arrangements at the shaft bottom.

REDUCTION PLANT—Following the decision by the Merriespruit (Orange Free State) Gold Mining Company that its Reduction Plant will be sited at the Merriespruit Mine, arrangements have been made for the Virginia Mine to take over for its own account the **25,000** tons per month unit which was commenced for the Merriespruit Mine, in conjunction with the erection of a similar unit for the Virginia Mine, on a site in the vicinity of No. **1** Shaft, Virginia.

This will provide an initial milling capacity of **50,000** tons per month, in accordance with the enlarged Capital Expenditure programme recently announced. Satisfactory progress was made during the Quarter on construction work.

HOUSING AND AMENITIES FOR EUROPEAN EMPLOYEES—During the Quarter, **28** houses, bringing the total to 132 houses in the permanent quarters, were completed and occupied. A further 10 houses were under construction. At the end of the Quarter, 284 families and 132 single persons were accommodated in the permanent and temporary quarters. Work is proceeding on a bowling green and on a turf cricket pitch.

NATIVE COMPOUNDS AND HOSPITAL—At the end of the Quarter, **1,669** Natives were housed in the permanent compounds. Work is proceeding on the permanent kitchen at No. **1** Shaft Compound. The Native Hospital has been completed.

MINE BUILDINGS—The erection of the initial portion of the permanent Workshop was commenced and work on extensions to the Compressor House is proceeding.

GENERAL—Work is proceeding on the tarred road between Nos. **1, 2** and **3** Shafts; **8,660** feet had been commissioned at the end of the quarter. **LABOUR**—The Labour strength at the end of the Quarter was: Europeans **288,** Natives **1,669.**

CAPITAL EXPENDITURE—Capital Expenditure amounting to **£610,280** was incurred during the Quarter on shaft sinking, buildings and plant. Of this amount, **£121,491** was apportioned to Merriespruit (Orange Free State) Gold Mining Company, Limited, in respect of joint Capital Expenditure.

The total Capital Expenditure, including preliminary expenses, incurred to 31st December, 1951, amounted to **£3,597,698.**

MIDDLE WITWATERSRAND (WESTERN AREAS), LIMITED

INTERESTS IN THE ORANGE FREE STATE

MINERAL RIGHTS—Your Company's interests in the Orange Free State consist of Mineral Rights purchased over **12,099** morgen in the Virginia Area; the farm van den Heeversrust No. 419, measuring **629** morgen, situate North-West of Odendaalsrus; the farm Klein Begin No. 911, measuring **129** morgen, adjoining the Western boundary of the Freddies North Lease Area; the farm Stephanus Rust No. 897, measuring **209** morgen, situate West of Odendaalsrus, and over a one-half undivided share of the farm Remaining Extent Wesselsgunst No. 261, measuring **58** morgen **1½** sq. roods, situate immediately North of the Freddies North Lease Area, Limited. Your Company retains its interest in Option Contracts over the farm Britzpan No. 1289, district Odendaalsrus, measuring **229** morgen; over **1,175** morgen in the Winburg district, and a participation in subscription rights accruing to Lydenburg Estates, Limited, in respect of certain of that Company's interests in the Orange Free State.

SURFACE RIGHTS—In terms of an Agreement completed on 21st May, 1951, your Company disposed of approximately **2,066** morgen of its Surface Rights in the Virginia Area to the Virginia Land & Estate Company, Limited, which has been formed for the establishment of the Virginia Township. As a result of this Agreement, your Company will have a considerable interest in Virginia Land & Estate Company, Limited. Your Company has also sold approximately **32** morgen of the Harmony Farm No. 222 to Virginia Orange Free State Gold Mining Company, Limited, for purposes ancillary to mining. At 31st December, 1951, your Company owned the freehold over **3,307** morgen in the Virginia and Odendaalsrus Areas.

INTERESTS IN THE KLERKSDORP DISTRICT OF THE TRANSVAAL

Your Company retains its interest in the Mineral Rights of the Eastern portion of the Klerksdorp Townlands, measuring **4,557** morgen approximately, and continues to hold a **98.4** per cent share of the Mineral Rights of a portion of the farm Elandsheuvel No. **54**, district Klerksdorp, measuring **254** morgen, **375** sq. roods.

Your Company retains its interest in options to purchase the Surface and Mineral Rights of certain portions of the farm Palmietfontein No. 29, district Klerksdorp, totalling **1,186** morgen approximately.

REPORT FOR QUARTER ENDED 31st DECEMBER, 1951. A total of **3,564** feet was drilled in **5** boreholes.

Borehole No.	Drilled on joint account with	Farm	Depth at 31st December, 1951 Feet	Formations traversed during Quarter: Borehole Depths (feet) From	To	Description	Reef	Reefs intersected: Depth feet	Value dwts.	Corrected width inches	Inch-dwts.	Remarks
VDH. 5/51	General Exploration Orange Free State, Limited	Van den Heeversrust No. 419, District Odendaalsrus	Deflections completed on 17th November, 1951				"A"	5,571	2.80	90.6	254	Faulted portion of "A" Reef. Deflection.
							"B"	5,819	16.1	11.7	188	Faulted portion of "B" Reef. Deflection.
							Basal	6,429	5.71	10.3	59	•3rd Deflection.
•Core recovery complete. The stratigraphic section revealed was closely comparable with that exposed in the first and second deflections.												
VDH. 6/51	General Exploration Orange Free State, Limited	Van den Heeversrust No. 419, District Odendaalsrus	5,610 In progress	4,930	5,364	Ventersdorp Sediments	"A"	5,410	0.77	62.1	48	
				5,364	5,504	Upper Witwatersrand Sediments	Uncorrelated	5,536	14.32	22.7	325	Core recovery incomplete.
				5,504	5,517	Intrusive with Faulting	Uncorrelated	5,580	2.86	94.6	271	Core recovery complete.
				5,517	5,610	Uncorrelated Sediments						
T.L. 29/51		Klerksdorp Townlands No. 44, District Klerksdorp	6,820	5,650	6,011	Upper Witwatersrand Sediments	Vaal	6,447	220.5	5.7	1,257	Core recovery nearly complete.
			Original borehole completed on 17th November, 1951	6,011	6,062	Gold Estates Reef Zone	Vaal	6,445	105.7	5.8	613	1st Deflection. Core recovery incomplete.
			Deflections completed on 15th December, 1951	6,062	6,106	Intrusive	Vaal	6,445	—	—	—	2nd Deflection. Not assayed: core badly ground
				6,106	6,820	Upper Witwatersrand Sediments	Vaal	6,445	74.2	5.8	430	3rd Deflection. Core recovery incomplete.
							Vaal	6,445	165.6	5.8	960	4th Deflection. Core recovery nearly complete.
T.L. 24/47		Klerksdorp Townlands No. 44, District Klerksdorp	Original borehole completed on 30th October, 1947				Vaal	1,113	1.06	60 (borehole width)		Original intersection. Now correlated as Vaal Reef.
			Deflection completed on 13th November, 1951				Vaal	1,113	1.21	46.6	56	Deflection of old borehole.
T.L. 20/47		Klerksdorp Townlands No. 44, District Klerksdorp	Original borehole completed on 10th June, 1947				Vaal	1,489	0.80	17 (borehole width)		Original intersection. Now correlated as Vaal Reef.
			1st Deflection completed on 11th December, 1951				Vaal	1,488	0.50	21.2	11	Deflection of old borehole. Faulted portion of Vaal Reef.
			Further deflection in progress									

In addition, the Company is participating in the drilling of the following boreholes in the Orange Free State:—

Borehole Number	Farm	Drilled by
BH.1 (RD.1)	Rosedale No. 898, District Odendaalsrus	General Exploration, Orange Free State, Limited
WN.6	Weltevreden No. 205, District Odendaalsrus	General Exploration, Orange Free State, Limited
BH.2 (SB.2)	Spes Bona No. 921, District Odendaalsrus	General Exploration, Orange Free State, Limited
ERK.1	Energie No. 896, District Odendaalsrus	Free State Development and Investment Corporation, Limited

DRILLING IN THE STILFONTEIN-HARTEBEESTFONTEIN AREA (LUCAS BLOCK)

During the Quarter ended 31st December, 1951, a total of **2,945** feet was drilled on joint account with Strathmore Development Company, Limited, in the following **3** boreholes: BU.4, BU.5, WI.12. These boreholes were in progress at the end of the Quarter.

(*Continued overleaf*

NEW KLERKSDORP GOLD ESTATES, LIMITED

Tons milled: **29,900** yielding **3,512.87** ounces fine.

Revenue from Gold	**£43,604**
Working Costs	**£40,364**
	£3,240
Sundry Revenue	**£730**
Working Profit for Quarter	**£3,970**
Working Costs per ton Milled	**27s. 0d.**
Working Costs per fine ounce recovered	**229s. 10d.**

In addition to the above revenue, **£1,666** accrued in respect of increased revenue from sales of gold at higher than standard prices, sold for manufacturing purposes during the three months October to December, 1951, inclusive. The Working Profit for the Quarter, as shown above, does not take into consideration interest on Loan, amounting to **£1,138** for the Quarter.

No liability was incurred for Mining Taxation payable to the Government in respect of the Profits earned for the Quarter.

CAPITAL EXPENDITURE—The expenditure on Capital Account for the Quarter amounted to **£5,423.**

DEVELOPMENT—The total footage advanced during the Quarter amounted to **1,767** feet. Of **1,645** feet sampled, **620** feet, equal to **37.7** per cent, proved payable at an average value of **3.70** dwts., over a channel width of **46** inches, equivalent to **169** inch-dwts. (The above results are based on actual sampling. No allowance has been made for adjustments necessary in the valuation of the corresponding Ore Reserve.)

ORE RESERVE—The Payable Ore Reserve as at 31st December, 1951, was estimated to amount to **443,000** tons, having an average value of **2.48** dwts., over a stoping width of **58.9** inches. Included in the above Ore Reserve is **341,000** tons of Commonage Reef, having an average value of **2.61** dwts., over a stoping width of **56.7** inches. In the compilation of the above Ore Reserve, the Pay Limit was based on the existing price of gold and anticipated Working Costs.

RAND LEASES (VOGELSTRUISFONTEIN) GOLD MINING COMPANY, LIMITED

PRODUCTION

Tons Crushed: **544,000** yielding **91,845** ounces fine.

		Per ton crushed	
Revenue from Gold	**£1,142,540**	**42s. 0d.**	
Working Costs	**£920,248**	**33s. 10d.**	**(200s. 5d.** per oz. fine)
	£222,292	**8s. 2d.**	
Sundry Revenue	**£10,500**	**0s. 5d.**	
Working Profit for Quarter	**£232,792**	**8s. 7d.**	

Working costs per ton, **33s. 10d.** include **5s. 1d.** in respect of development expenditure.

In addition to the above revenue, **£40,865** accrued in respect of increased revenue from the sales of gold at higher than standard prices, sold for manufacturing purposes during the three months October to December, 1951, inclusive.

The Working Profit for the Quarter, as shown above, does not take into consideration the amount estimated at **£95,500** for the Quarter, payable to the Government in Taxation and as its share of the Profits in terms of the Mining Lease.

CAPITAL EXPENDITURE—The expenditure on Capital Account for the Quarter amounted to **£32,172.**

SHAFT SINKING

No. 11A SUBVERTICAL SHAFT was sunk **187** feet during the Quarter to its final depth of **2,986** feet. In addition, **20** feet of station cross-cutting were advanced on the **36th** level; **16** feet were advanced and **4,320** cubic feet were excavated in connection with the 36th level loading bin; and a further **864** cubic feet of station cutting were excavated on the **30th** level. The shaft was concrete lined to a depth of **2,984** feet, of which **221** feet were accomplished during the Quarter.

No. 2 KIMBERLEY REEF INCLINE SHAFT—A total of **234** feet was risen and sunk at small dimensions during the Quarter, bringing the total footage so advanced to **1,016** feet. A total of **633** feet of shaft length has been sliped to full dimensions, of which **312** feet were done during the Quarter.

DEVELOPMENT

MAIN REEF SERIES—12,693 feet of development and shaft sinking were accomplished, of which **5,020** feet were sampled, showing **2,995** feet, equal to **60** per cent., as payable at an average value of **15.84** dwts., over an average channel width of **18.0** inches, equivalent to **285** inch-dwts. Payable reef disclosures were distributed as follows:—

SOUTH REEF—Of **730** feet sampled, **515** feet, equal to **70** per cent, were payable at an average value of **31.30** dwts., over an average channel width of **10.9** inches, equivalent to **342** inch-dwts.

MAIN REEF LEADER—Of **2,840** feet sampled, **1,610** feet, equal to **57** per cent, were payable at an average value of **23.93** dwts., over an average channel width of **12.0** inches, equivalent to **286** inch-dwts.

MAIN REEF—Of **1,450** feet sampled, **870** feet, equal to **60** per cent, were payable at an average value of **7.45** dwts., over an average channel width of **33.3** inches, equivalent to **248** inch-dwts.

BIRD AND KIMBERLEY REEFS—In addition to the above footage on Main Reef Series, **1,118** feet were advanced on Bird Reef and **3,075** feet on Kimberley Reef. Payable Reef disclosures were as follows:—

BIRD REEF—Of **810** feet sampled, **560** feet, equal to **69** per cent, were payable at an average value of **3.83** dwts., over an average channel width of **58.6** inches, equivalent to **224** inch-dwts.

KIMBERLEY REEF—Of **1,900** feet sampled, **370** feet, equal to **19** per cent, were payable at an average value of **4.34** dwts., over an average channel width of **33.4** inches, equivalent to **145** inch-dwts. (The above results are based on actual sampling. No allowance has been made for adjustments necessary in the valuation of the corresponding Ore Reserve.)

DIVIDEND—A dividend (No. **31**) of **17½** per cent **(1s. 9d.** per Share) was declared payable to Shareholders registered at 31st December, 1951.

VILLAGE MAIN REEF GOLD MINING COMPANY (1934), LIMITED

PRODUCTION

Tons Treated: **102,350** yielding **15,939.10** ounces fine.

		Per ton treated	
Revenue from Gold	**£198,489**	**38s. 10d.**	
Working Costs	**£144,467**	**28s. 3d.**	**(181s. 3d.** per ounce fine)
Working Profit	**£54,022**	**10s. 7d.**	

Working Costs per ton **28s. 3d.** include **5s. 1d.** in respect of development expenditure.

In addition to the above revenue, **£7,663** accrued in respect of increased revenue from the sales of gold at higher than standard prices, sold for manufacturing purposes during the three months October to December, 1951.

The Working Profit for the Quarter, as shown above, does not take into consideration interest on loans amounting to **£543** for the Quarter, nor the further amount payable to the Government in Mining Taxation, estimated at **£27,500** for the Quarter.

CAPITAL EXPENDITURE—The expenditure on Capital Account during the Quarter amounted to **£340.**

DEVELOPMENT—**7,213** feet of development were advanced during the Quarter and **3,861** feet of old drives and crosscuts were reconditioned. In addition, **788** feet of underground diamond drilling were done as an aid to development.

DIVIDEND—A dividend (No. **23**) of **12** per cent **(1s. 8d.** per Share) was declared payable to Shareholders registered at 31st December, 1951.

JOHANNESBURG CONSOLIDATED INVESTMENT CO., LTD.

(Incorporated in the Union of South Africa)

MINING COMPANIES' REPORTS FOR QUARTER ENDED 31st DECEMBER, 1951

GENERAL REMARKS—The revenue from gold has been calculated on the basis of gold at **248s. 3d.** per ounce fine. In determining the payable development footage, gold has been taken at **248s. 3d.** per ounce fine. The development figures are the actual results of the sampling of development work on reef; no allowance has been made for modifications which may be necessary when computing the ore reserves.

10 and 11, Austin Friars, London, E.C.2. 6th February, 1952.

The East Champ D'Or Gold Mining Co. Ltd.
(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....**£259,875**
Crushed **95,000** tons; yielding **14,862** ounces fine gold.

	£		Per ton crushed s. d.		Per oz. fine gold produced s. d.
Revenue from Gold.....	**184,479**	...	**38 10**	...	
Working Costs.....	**152,855**	...	**32 2**	...	**205 8**
	31,624	...	**6 8**		
Sundry Revenue.....	**904**				
Profit for Quarter.....	**32,528**				

In addition to the above, **£5,930** accrued during the quarter in respect of increased revenue from sales of gold at enhanced prices.

Taxation for the quarter is estimated at **£15,627.**

The expenditure on Capital Account amounted to **£301.**

DIVIDEND No. 30 of **15** per cent (**4½d.** per **2s. 6d.** share) has been declared in Union of South Africa currency, payable to shareholders registered at 31st December, 1951.

The **DEVELOPMENT FOOTAGE** sampled totalled **375** feet, and gave the following results: **PAYABLE, 155** feet, having an average value of **7.1** dwts. over **24** inches. **UNPAYABLE, 220** feet, having an average value of **1.8** dwts. over **39** inches.

The **ORE RESERVES** at the end of the year were estimated to amount to **377,000** tons, with an average value of **3.5** dwts. over a stoping width of **46** inches.

Government Gold Mining Areas (Modderfontein) Consolidated Ltd.
(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....**£1,400,000**
Crushed **693,000** tons; yielding **93,043** ounces fine gold.

	£		Per ton crushed s. d.		Per oz. fine gold produced s. d.
Revenue from Gold.....	**1,179,716**	...	**34 1**		
Working Costs.....	**1,056,770**	...	**30 6**	...	**222 5**
	122,946	...	**3 7**		
Sundry Revenue.....	**23,104**				
Profit for Quarter.....	**146,050**				

In addition to the above **£40,001** accrued during the quarter in respect of increased revenue from sales of gold at enhanced prices.

The Government's share of profits for the quarter is estimated at **£35,259.**

The expenditure on Capital Account amounted to **£4,624.**

DIVIDEND No. 69 of **20** per cent (**1s.** per **5s.** share) has been declared in Union of South Africa currency, payable to shareholders registered at 31st December, 1951.

The **DEVELOPMENT FOOTAGE** sampled totalled **9,815** feet, and gave the following results: **PAYABLE, 5,750** feet, having an average value of **5.0** dwts. over **40** inches. **UNPAYABLE, 4,065** feet, having an average value of **1.7** dwts. over **35** inches.

The **ORE RESERVES** at the end of the year were estimated to amount to **7,801,000** tons, with an average value of **2.9** dwts. over a stoping width of **59** inches.

New State Areas Ltd.
(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....**£1,514,037**
Crushed **145,000** tons; yielding **22,053** ounces fine gold.

	£		Per ton crushed s. d.		Per oz. fine gold produced s. d.
Revenue from Gold.....	**273,736**	...	**37 9**		
Working Costs.....	**275,303**	...	**38 0**	...	**249 8**
	1,567	...	*0 3*		
Sundry Revenue.....	**3,861**				
Profit for Quarter.....	**2,294**				

In addition to the above, **£9,244** accrued during the quarter in respect o increased revenue from sales of gold at enhanced prices.

(*Note:* There was no liability in respect of Government's share of profits or taxation for the quarter.)

DIVIDEND No. 54 of **3¼** per cent (**7½d.** per share) has been declared in Union of South Africa currency, payable to shareholders registered at 31st December, 1951.

The **DEVELOPMENT FOOTAGE** sampled totalled **1,701** feet, and gave the following results: **PAYABLE, 687** feet, having an average value of **8.8** dwts. over **23** inches. **UNPAYABLE, 1,014** feet, having an average value of **2.5** dwts. over **20** inches.

The **ORE RESERVES** at the end of the year were estimated to amount to **205,000** tons, with an average value of **4.3** dwts. over a stoping width of **45** inches.

The Randfontein Estates Gold Mining Co., Witwatersrand, Ltd.
(Incorporated in the Union of South Africa

ISSUED CAPITAL.....**£4,063,553**
Crushed **1,034,000** tons; yielding **122,150** ounces fine gold.

	£		Per ton crushed s. d.		Per oz. fine gold produced s. d.
Revenue from Gold.....	**1,516,189**	...	**29 4**		
Working Costs.....	**1,443,772**	...	**27 11**	...	**236 5**
	72,417	...	**1 5**		
Sundry Revenue.....	**15,582**				
Profit for Quarter.....	**87,999**				

In addition to the above, **£52,251** accrued during the quarter in respect of increased revenue from sales of gold at enhanced prices.

Taxation for the quarter is estimated at **£4,164.**

The expenditure on Capital Account amounted to **£11,601.**

DIVIDEND No. 43 of **5** per cent (**1s.** per share) has been declared in Union of South Africa currency, payable to shareholders registered at 31st December, 1951.

The **DEVELOPMENT FOOTAGE** sampled totalled **12,325** feet, and gave the following results: **PAYABLE, 3,900** feet, having an average value of **5.8** dwts. over **45** inches. **UNPAYABLE, 8,425** feet, having an average value of **1.8** dwts. over **40** inches.

The **ORE RESERVES** at the end of the year were estimated to amount to **4,090,000** tons, with an average value of **3.0** dwts. over a stoping width of **50** inches.

ANGLO AMERICAN CORPORATION GROUP OF COMPANIES

DECLARATION OF DIVIDENDS

NOTICE IS HEREBY GIVEN that dividends in respect of the year ended 31st December, 1951 have been declared payable to shareholders registered in the books of the undermentioned companies at the close of business on the 15th February, 1952.

The dividends are declared in the currency of the Union of South Africa and become due on the 16th February, 1952. Warrants will be posted from the Head and London Offices on or about the 20th March, 1952.

The dividends are payable subject to the usual conditions, which can be inspected at the Head and London Offices of the Companies.

The Transfer Books and Registers of Members will be closed in each case from the 16th February, 1952 to 23rd February, 1952, both days inclusive.

Name of Company (Each of which is incorporated in the Union of South Africa)	*Dividend No.*	*Rate of Dividend per share in Union of South Africa Currency*	*Effective Rates Non-Resident Shareholders' Tax*	*Estimated Profit for year ended 31.12.51 after providing for Taxation*
(*a*) Anglo American Investment Trust Limited.....	24	8s.	6.075%	£2,259,000 (Previous year £1,718,000)
(*b*) The New Era Consolidated Limited	63	7½d.	6.075%	£133,000 (Previous year £133,000)
(*c*) West Rand Investment Trust Limited.....	8	9d.	7.5%	£614,000 (Previous year £520,000)

NOTES

(*a*) Final Dividend making with the Interim Dividend of 4s. declared on the 21st June, 1951, a total of 12s. for the year. £750,000 has been transferred to General Reserve.

(*b*) Final Dividend making with the Interim Dividend of 6d. declared on the 21st June, 1951, a total of 1s. 1½d. for the year.

(*c*) Final Dividend making with the Interim Dividend of 7½d. declared, on the 21st June, 1951, a total of 1s. 4½d. for the year.

By Order of the Boards,

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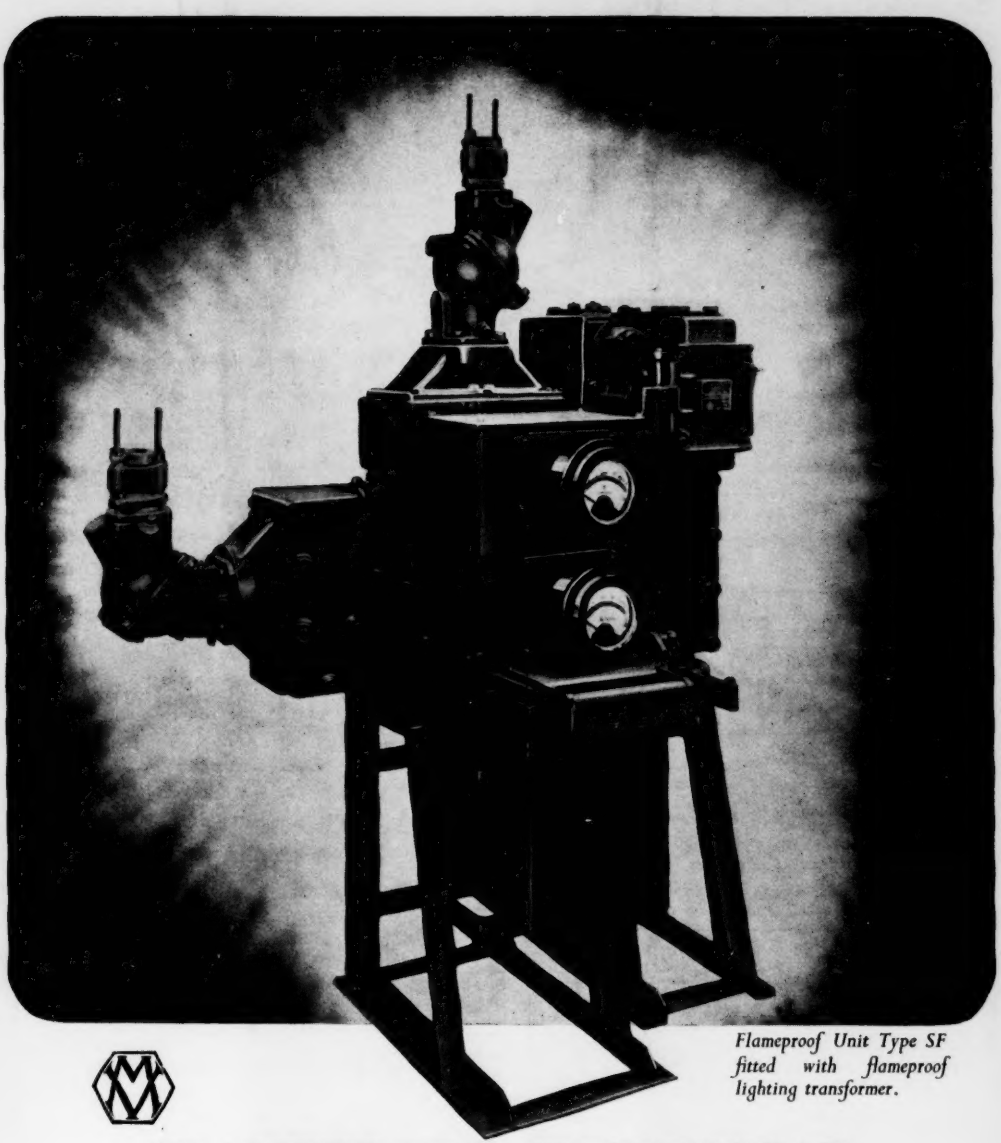

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